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ABSTRACT

In this thesis, consideration is given to the interrelationships between a number of key concepts (devolution, decentralization, participation, consultation, coordination, and networking) and reports in educational and general public administration which have been produced over the last decade. Networking is the interconnecting concept. In the first half of the thesis, emphasis is on the current relationships between the key themes and educational and general public administrative structures and strategies. In the second half a variation of the "brainstorming" technique (involving purely the author rather than a group of individuals) has been used to produce a scenario of possible educational and general public administrative structures and strategies in the 1980s and 90s; this scenario emphasizes the possible interrelationships between these structures and strategies, the key themes, and communications networks. A case study then follows which links the key themes and the scenario by including discussion of one senior educational administrator's perceptions of probable futures for a particular education system. It is concluded that there is great potential for new technologies such as computer conferencing and data processing to assist with the restructuring of educational and general public administration. Recommendations on how this could be achieved are given. A list of descriptors and identifiers used in a computer search of ERIC for this thesis is attached. (Author/DMC)

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"THE NETWORK NATION - THE RELEVANCE OF THIS FOR POSSIBLE EDUCATIONAL AND GENERAL PUBLIC ADMINISTRATIVE STRUCTURES AND STRATEGIES IN THE 1980s AND 90s."

by ANDREW R. FREEMAN

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iii. Abstract.

In this thesis consideration is given to the inter-relationships between a number of key concepts and reports in educational and general public administration which have been produced over the last decade. Networking is the inter-connecting concept. In the first half of the thesis the emphasis is on the current relationships between the key themes and educational and general public administrative structures and strategies. In the second half a variation of the "brainstorming" technique (involving purely the author rather than a group of individuals) has been used to produce a scenario of possible educational and general public administrative structures and strategies in the 1980s and 90s (with an emphasis on the possible inter-relationships between these structures and strategies, the key themes, and communications networks).

A case study then follows which links the key themes and the scenario by including discussion of one senior educational administrator's perceptions of probable futures for a particular education system.

It is concluded that there is great potential for new technologies to assist with the restructuring of educational and general public administration. Recommendations on how this could be achieved are given.

iv. Overview.

In this thesis consideration is given to developments in telecommunications and computing technologies in relation to possible educational and general public administrative structures and strategies which could be implemented in the 1980s and 90s. Consideration is given in particular to structures and strategies considered in such reports as the Victorian Government White Paper on "Strategies and Structures for Education in Victorian Government Schools" (the White Paper), Commonwealth Reviews of Public Administration in the Australian Public Service (APS) (specifically the "Royal Commission into Australian Government Administration" [RCAGA], the "Review of Commonwealth Administration" [RCA], and the "Joint Management Review of ADP Management Issues in the Australian Public Service" [JMR]).

A number of themes appear in both the RCAGA report (Dr. H. C. Coombs was the Chairman of the RCAGA) and the White Paper (and less explicitly in the RCA Report). The JMR also includes specific consideration of how a number of these themes could be implemented using information technologies. In this thesis I consider six of these themes in detail - from the point of view of both educational administrative, and more general public administrative, structures and strategies.

These themes are:

* devolution;
* decentralisation;
* participation;
* consultation;
* co-ordination; and

* networking.

I note that these themes are increasingly inter-connected and will become more so in the future. Specifically, consideration is given to how networks (with an emphasis on networks which incorporate computer and telecommunications technologies) could assist with the implementation of the key themes.

Particular consideration is given to the different ways in which these themes are interpreted in each of the reports analysed.

Consideration is also given to the need for matrix approaches to management in turbulent environments, and to how a number of telecommunications and computing technologies could assist with the implementation of innovative organisational structures.

The "findings" section of this thesis involves the presentation of a scenario of how educational and general public administrative systems might be operating up to 1995, with a particular emphasis on the key themes considered in the first part of the thesis. The terms "educational" and "general public administrative" are interpreted broadly in this scenario. The scenario is designed to highlight a number of possible futures.

A case study follows which includes a key component dealing with one educational administrator's views on the practicality of implementing a number of the educational thrusts included in the scenario (that is, with a focus on probable futures).

The key conclusion of this thesis is that computer conferencing, data processing, and other new technologies (including new approaches to organisational design) have great potential to assist with the restructuring of educational and general public

administrative systems in the 1980s and 90s.

Recommendations on changes which need to be made now if the full potential of these new technologies is to be realised are included.

CHAPTER 1. REVIEW OF RELATED LITERATURE

Six themes have been selected for a detailed literature review. This review is limited to the extent that I have concentrated on more theoretical literature. In the body of the thesis I have included much of the literature of direct relevance to educational and general public administration.

The selected themes are conceptually related in that they directly relate, both individually and collectively, to problems related to networking and to potential structures and strategies for education and general public administration in the future.

In the second part of the review of related literature I outline the key reports I have selected, and give a brief introduction to how they relate to the key themes.

REVIEW OF RELATED LITERATURE ON KEY THEMES

I have attempted to include much of the literature reviewed within the main body of this thesis. In this section I will, however, give a brief outline of some of the material which has been written broadly around the key themes.

1-1. CO-ORDINATION

Co-ordination is a key part of managing. A report of the Parliamentary Joint Committee of Public Accounts (JCPA) has defined managing as involving "...initiating, guiding, and evaluating. Thus management is decision-making and getting things done by other people. In order to manage successfully there is a need to be able to motivate people, to communicate to them what they should be doing, what results should be achieved, and how to

achieve them." (JCPA, 1982, p. 7).

Co-ordination relates to monitoring systems, and ensuring that goals and objectives are achieved (it is thus related more to the guiding and evaluating components of the above definition than to the initiating component). In order for evaluation to occur, it is necessary that objectives be specified in measureable terms.

It is interesting to note, in relation to this that "At one stage the Committee [of Inquiry into the S.A. Public Service in the mid-1970s] requested existing departments to 'state their objectives, the purposes for which they exist'. The report noted that 'only a small minority could point to authoritative statements of their objectives, readily available and recently reviewed'. As a result it proposed that the objectives and functions of departments should be 'clearly set out' and be 'available to serve as terms of reference' to staff and public...'." (Jaensch, 1978, p. 78).

Dror has indicated that "Clarification of aims is vital in order to provide standards for the appraisal of various alternatives." (Dror, 1971, p. 248). One key aspect of co-ordination involves choosing between alternative strategies. Over time this involves evaluating current strategies and choosing to continue with those which are found to be more effective and efficient. Without clear aims it is not possible to evaluate which strategies are the most effective.

It is essential, where evaluations take place, and it is found that resources are not being used efficiently or effectively, that it be possible to re-allocate these resources. For example,

it has been said that "The major weakness in Victoria's autonomous agencies has been the absence of machinery for disbanding them when they no longer articulate and implement significant social values." (Holmes, 1978, p. 109). Such a re-allocation of resources is much easier for Ministers when dealing with components of their Departments than when dealing with statutory authorities for which they are responsible but over which they do not have complete power of direction. However, the ability to re-allocate resources is not sufficient to ensure effective co-ordination. As Chapman has pointed out "No amount of tinkering with organizational structures can reduce the need for properly qualified, competent officers." (1978, p. 294). It is also necessary that administrators be allocated sufficient resources.

Co-ordination in government is not just a problem in Australia. In Tanzania it has been observed that "...at present, each functional officer is responsible only to his own Ministry in Dar es Salaam, so that it is extremely difficult to work out a Regional or District development or problem-solving scheme which calls for co-ordinated action." (Nyerere, 1972, p. 1). This problem has also been recognised in Australia. The RCAGA initiated the development (on a pilot basis) of a co-ordinated approach to regional service delivery. "The NOW centre (North west One stop Welfare centre) was opened in Coburg in July 1975. It aimed to provide a single location for various commonwealth, state, and local government departments and voluntary organizations to deliver services of various kinds to the community." (Painter, 1978, p. 245). It was also found that this approach facilitated a more participatory response from citizens

in that "...the centre has succeeded generally in providing a more pleasant environment for "fronting up" to officialdom." (Painter, 1978, p. 245).

Participation by citizens can facilitate the identification of alternative goals and objectives, together with the "value constructs" upon which these are based. As Henderson has pointed out "A persistent condition underlying social conflict is the differing set of subjective assumptions and levels of awareness by which groups perceive the same objective set of circumstances. Often the only time that such underlying perceptions can be made explicit, then explored and mediated, is when they clash in an open confrontation." (1978, p. 239).

Power is a key theme in considering such open confrontations, or in analysing such concepts as devolution. "Weber defines 'power' (Macht) as the probability that an actor will be able to realise his own objectives even against opposition from others with whom he is in a social relationship." (Giddens, 1971, p. 156).

1-2 DEVOLUTION

Devolution refers to the transfer of power and responsibility from one group within a government or administrative system to another group further from the centre of power within that system (Victoria, 1988, p. 11). The emphasis is generally on devolving power so that people can have more influence on policies which directly affect them.

Devolution is increasingly being seen as a solution to system breakdowns resulting from these systems being too large to allow for a co-ordinated approach to societal problem-solving. However,

it is important to realise that some issues will still require a national input if they are to be handled effectively. For example, "...in the United States...it is now conceded that the problems created by population growth and urban concentration are too big to be handled by the States or cities alone." (Brennan, 1972, p. 44). The emphasis should be on devolving powers which can be more effectively co-ordinated at the local level, rather than simply on breaking-up large systems which are not operating effectively. Where systems are not operating effectively in an area which requires a substantial national input, the emphasis should instead be on re-designing the system to allow for effective management (often this will involve the use of distributed computer networks).

Devolution can create difficulties in situations where power is devolved to local units, but where the central authority (and Minister ultimately) still retains accountability for that area. For example, "The [W.A.] Department [of Education] implemented a decentralisation policy to devolve decision making by creating regional offices. The fundamental principles guiding this devolution of authority were stated as:

(a) decisions are more effectively made in the light of local circumstances;

(b) persons affected by a decision should participate in making the decision;

(c) the Minister for Education remains responsible for the education system, irrespective of who makes the decision; and

(d) the public are entitled to demand accountability for funds expended and outcomes achieved." (Neesham, 1978, p. 25).

In the case of W.A. it is clear that what is talked about is

decentralisation rather than devolution, in that responsibility is not transfered, and in extreme situations the Minister maintains the power of direction.

More generally, insufficient thought seems to have been given to the question of how a Minister can remain responsible for an area over which he has no ability to give direction. In management there is a general principle that it is inappropriate to make a position responsible for an activity if the person holding the position does not have complete control over the area.

1-3. PARTICIPATION

Elliot and Elliot have argued that "...the word 'participation' has a number of meanings. In general it suggests that individuals or groups are in some way able to directly influence and be involved with decision-making." (1976, p. 138).

As well as having a number of interpretations, participation as a concept has a long history. "It would...be misleading to suggest that the question of participation within democratic systems is a new one for it has preoccupied political thinkers for centuries." (Higgins and Richardson, 1976, p. 5). In the UK "Over the last decade a renewed interest in encouraging more direct public participation in services provided by both local and central government bodies has been reflected in a number of government acts, reports and white papers." (Crousaz et al., 1978, p. 1). In the USA "The federal government has required citizen participation in various programs since the 1930s, when farmers were brought into decision-making about crop allotments." (Dommel and Associates, 1982, p. 15).

Historically, there are examples of participation as an integral part of citizenship. "In the Greek polis every man - that is, every free citizen - was a zoon politikon: the social and political were inextricably fused, and there was no separate sphere of the 'political'." (Giddens, 1971, p. 5).

In various programs in the USA and Australia there has been an attempt to recreate to some degree such an idealised situation. In the USA, "Federal legislation in the health field requires the creation of community committees for funding, particularly in those areas related to minority-group services." (Fantini and Gittell, 1973, p. 18). The need for local (and, in particular, disadvantaged community) participation in federally-funded programs in Australia has been recognised since the early 1970s in fields as diverse as education and health. One author has gone as far as to suggest that "There were some aspects of Federal Labor Government policies [in the 1970s] in the field of social welfare (especially the Australian Assistance Plan (AAP)), which indicated that one major purpose was to increase the involvement of the community in defining its own needs." (Chapman, 1982, p. 17).

It has been argued that "...human beings do have power to control technology, but...this power is not at present evenly distributed between individuals and groups in society." (Elliot and Elliot, 1976, p. 181). Participation in governmental processes (at all levels) relates to questions of power - "...the powerless see community control as a way not only to make institutions more responsive to their needs but also to exercise their share of power within society." (Fantini and Gittell, 1973, p. 8).

However, "What democrats fear is that participatory processes of decision-making will favour articulate minorities just as much as more old fashioned processes." (Higgins and Richardson, 1976, p. 18). This fear is heightened by the fact that "...there is a great deal of evidence suggesting that a decisive factor in influencing the extent to which people participate in politics and get involved in voluntary group activity is the length of formal education they have been exposed to." (Sharpe, 1979, p. 28). It is also of concern that "Numerous studies have noted a relationship between social class or status and community participation." (Parkum and Parkum, 1980, p. 156).

However, participatory theorists would argue that one of the main reasons that people with lower status so rarely participate in societal decision-making processes is that they are given little opportunity to do so. "One of the main tenants of 'participatory theory' is that the experience of participation will lead to an enlarged ability to participate and that experience of lower levels of control may lead to an interest in higher levels and hence towards the ultimate goal of 'participatory democracy'." (Elliot and Elliot, 1976, p. 194).

It may be because of the fundamental relationship between participation and power that "The larger expectations [resulting from the RCAGA report] about responsiveness and participation, dispersal of bureaucratic power and the diffusion of government structures have not been realised." (Chapman, 1982, p. 27). Certainly it would be naive to expect participation to result in a reduction in conflict between the bureaucracy and citizens. The argument that "...what seems to be needed is policy-making machinery to resolve the political conflict planning programmers

provoke among experts and specialists, as well as among the general public." (Holmes, 1978, p. 104) would appear to be a false hope when seen in this light - the best one could hope for would be conflict based on a true perception of the facts, rather than a reduction in conflict as such between competing interest groups.

One of the key barriers to greater community participation in oversighting government programs is that of professional autonomy. Yates has pointed out that "...in contrast to the doctrine of pluralist democracy, "neutral competence" gives substantial political power and authority to administrators rather than to citizens and elected officials." (1982, p. 24). It also needs to be recognised that "...administrators in a public bureaucracy can only strive for professional autonomy at the expense of external accountability." (Scott, 1978, p. 198).

"A major reservation expressed by many professionals about 'participation', is that it tends to prolong the dialogue beyond the point of being useful, especially if there is a failure to agree on the plan being debated." (Elliot and Elliot, 1976, p. 179).

Social trends will doubtless continue to place pressure on bureaucracies to permit increased participation. For example, "The trend to egalitarianism in our society may be expected to increase participation." (Bennett, 1980, p. 4). However, participation should not be seen as a "panacea" in all circumstances because "...a truly decentralized participatory system will tend to be highly responsive to the needs of the members in each participatory locality, but will tend to neglect

inter-local, inter-regional and national needs, both of the allocative (e.g., social justice) type and those which are best served collectively (e.g., a priming of the economy)." (Etzioni, 1971, p. 64). Taking this into account "One of the most interesting features of recent decentralist reform has been the effort of central authorities to promote participation at the local level." (Magnusson, 1979, p. 131). This may be explained if one considers that the emphasis has been on having the participation focus on issues of local rather than national concern.

The relationship between decentralisation and participation is illustrated by the fact that "Distributed decision making seems to be a prerequeisite [sic] to meaningful participation. But the decentralisation which makes this possible is not necessarily good, as unlimited local variations can lead to organisational chaos." (Bennett, 1980, p. 6).

Also, "In its most developed form participation...means that the citizen is directly concerned with every level of the decision-making process. This implies a considerable devolution of power, and consequently the decentralization of the decision-making process, in an attempt to enlarge the democratic and self-determining powers of the individual or group." (Elliot and Elliot, 1976, p. 139).

There are, however, difficulties in implementing such a concept. These are reflected in the fact that "[An]...argument commonly used against greater participation is that it is inefficient." (Higgins and Richardson, 1976, p. 9). It has been argued that "...involving the community directly in the planning process will

make the planning period a more difficult and a longer one." (Fantini and Gittell, 1973, p. 100). Higgins and Richardson have also indicated that "Once open discussion becomes the basis of decisions, then they tend to take an inordinate length of time." (1976, p. 11). There is clearly a trade-off between traditional interpretations of short-term efficiency and the need for participation. However, in the longer term there is no question that allowing for participation will often tend to result in more "stable" decisions and a more efficient allocation of resources, particularly in areas where community groups can bring about policy change through the electoral process or civil disobedience.

Research has found that:

* "Participation in an organized group effort is more likely to be successful than random individual attempts to affect community change." (Parkum and Parkum, 1980, p. 166). This highlights the benefits for individuals who hope to influence systems in a particular direction (either within an organisation or in society at large) to attempt to develop or join networks of individuals or groups with similar objectives.

* "A cultural environment in which constructive activism is stressed and receives publicity is important both for encouraging people to participate in community shaping and planning and for creating or opening up the actual structures for such participation." (Parkum and Parkum, 1980, p. 166). This partly explains the difficulty governments sometimes face in gaining input from a community which may be unused to, and possibly unaware of, the benefits which can potentially result from

participation in governmental decision-making processes.

* Those with access to greater amounts of "retained information" (Smith, 1980, p. 469) tend to participate more. "Retained information" results from educational activities (of a formal or informal nature), and from using skills developed in educational activities.

* "There are limits to the extent to which participation is possible. These limits are set by the time available to a citizen, by his interest, and by the extent of his fatigue after his other obligations to society have been discharged." (Bennett, 1980, p. 1).

* "Citizens are most likely to participate in government at the local level given the higher transaction costs of dealing with more distant governments." (Yates, 1982, p. 199).

* "...individuals active in one type of discretionary activity of a socioculturally encouraged sort are also likely to be active in other types of encouraged discretionary activity." (Smith, 1980, p. 462).

From the above evidence it is reasonable to conclude that "The best location to prepare the citizen for increased policymaking role is in schools, when the necessary knowledge and capabilities should be developed as a basic part of the equipment needed by every citizen in a modern urban democratic society." (Dror, 1971, p. 301), and that "An educated populace is a precondition for improved participation." (Bennett, 1980, p. 3).

1-4. DECENTRALISATION

Decentralisation in an organisational context refers to the transfer of power away from the centre of an organisation to other parts of the organisation (Victoria, 1980, 11). Generally, (but not necessarily) these other parts of the organisation will be geographically dispersed.

However, the term "...decentralization is an ambiguous word; it has come to mean different things to different people." (Fantini and Gittell, 1973, p. 12). Some interpret it in a purely physical planning sense. This is understandable in the Australian context because "Australia is the most urbanised society in the world with 88.5 per cent of its population living in cities." (Brennan, 1972, p. 1).

Decentralisation should not be interpreted as always being desirable. "Centralization, written law, and fixed rules were originally regarded as liberating...If you are a black in Mississippi you are a lot better off dealing with a federal court operating under formal and universalized rules than with a local sheriff operating on the basis of personalized local criteria." (Ferkiss, 1972, p. 29).

One interpretation of decentralisation emphasises its relationship with power. For example, Fantini and Gittell have written that "Decentralization [in an educational context] deals with the governance of urban school systems. Since politics deals with power, it is not surprising that this pattern of particiation produces controversy." (1973, p. 45). Conflict is not necessarily a bad thing - without it systems would tend to stagnate. "Many social scientists agree that change is a product

of conflict, and that such conflict should be anticipated if any significant shift in power is embodied in the plans for urban decentralization." (Fantini and Gittell, 1973, pp. 19 - 20). The relationship between conflict and changes in power relationships is also reflected in the fact that "The ghetto riots which broke out in the mid-1960s intensified the pressure for decentralization in American cities." (Magnusson, 1979, p. 134).

It is consistent with a philosophy which links decentralisation with power structures to argue that "The key to any decentralized system lies in the level at which decisions are made." (Fantini and Gittell, 1973, p. 104). This is emphasised in the comment that "...greater decentralization of services does not necessarily mean that there will be increased citizen involvement relative to the delivery of such services." (Stenberg, 1972, pp. 12 - 13). Certainly if decisions are always made at a level remote from the clients of the system such a "decentralised" system could not be defined as facilitating client participation.

In this context it is relevant to consider that one critic of centralisation has indicated that "Centralization in administration tends to promote absentee control, and thereby increasingly denies to the individual the opportunity to make decisions and to carry those responsibilities by which human personality is nourished and developed." (Lilienthal, 1971, p. 411). Ferkiss has pointed out that "Might not new forms of technology...make possible a greater degree of decentralization, local autonomy, and individual freedom." (1972, p. 30).

Research has shown that:

* "The higher the skill level of the manager, the greater the tendency to decentralize." (Morris, 1968, p. 20). This is relevant to both educational and public administrative systems where skill levels are continually increasing: for example, the entry level qualifications of administrators now as compared with those of ten years ago.

* "A side effect of decentralization is the training of a large number of experienced decision-makers." (Morris, 1968, p. 21). This is interesting to note in the context of the massive need for higher-level executives which is predicted to occur in the APS over the next ten years as a result of retirements from the Second Division of the APS (JCPA, 1982, p. 1);

* "Decentralized decision-makers tend to view their roles as being characterised by a degree of self-determination and independence." (Morris, 1968, p. 21). It is important to realise that improved morale of workers does not necessarily mean that productivity is increased, or that decentralised structures are appropriate in all circumstances. However, if other things were equal, this factor could well be a deciding one favouring a decentralised structure over a centralised one.

* "The fewer the number of operational linkages between the components of an organization, the greater the tendency to decentralize." (Morris, 1968, p. 19). This would tend to imply that it would be easier to decentralise those aspects of systems which do not interact with other components, rather than those which do. A real danger here is that there may be superficial analysis resulting in decisions to decentralise areas which in the immediate context do not interact with other components in

the State (for example, school curriculum) but which do so in the longer term.

* "The greater the urgency of a decision and the shorter the time in which to make it the greater the tendency to centralize." (Morris, 1968, p. 19). This would explain why decision-making tends to be more centralised in emergency situations than in situations where systems are not under threat.. This is reflected in the interest governments take in school councils which are not operating effectively to the extent that they create adverse publicity for the government of the day.

* "The greater the potential consequences of a decision, the more likely it is to be centralized." (Morris, 1968, p. 19). Taking this into account, it is unlikely that all decision-making authority will ever be devolved to schools or area offices. The devolution will tend to be in areas where mistakes will have only a localised effect.

* "Top management attempt to reduce the 'dangers' of necessarily decentralised control by establishing the bases of the delegated decision-making, and the final outcomes of subordinates' decisions, through established procedures and rules." (Salaman, 1979, p. 136).

* "Given the limited human and organizational capacities for data-handling, computation, and decision, decentralization will be more effective than centralization." (Morris, 1968, p. 19). However, as computers become more sophisticated, centralisation of large systems, if desired, could be more viable.

It is interesting to note, in the context of the above research

findings, the comment of one analyst that "The centralist trend is a world wide phenomena." (Brennan, 1972, p. 5). In the light of the research findings outlined above it is probable that this is true in areas which have a large number of operational linkages, where there is urgency in the decision-making process, where the consequences of mistakes would have a significant impact, and where there is significant data-handling capability. The education system at the school level is not perceived by many to be characterised by the first three features, and the central offices of most education systems (in Australia) are not characterised by the last. This can be compared with the APS, where some Departments have the above characteristics and others do not.

"Strong feelings of anxiety have been raised in the State government sphere as a consequence of moves to regionalisation." (Chapman, 1982, p. 8). This comment is interesting when it is taken together with the statement that "Because the movement for decentralization hinges on the question of the distribution of powers between central unit and its number of component parts, it can appropriately be compared to the theory and experience of federalism." (Fantini and Gittell, 1973, p. 20).

1-5. CONSULTATION

Consultation has a number of key features. It involves a sharing of, and receiving feedback on, information. (Victoria, 1980, p. 16). It could be argued that real consultation requires action to be taken based on the feedback - otherwise the consultative process will come to be seen as tokenistic.

A society cannot be democratic, in the most complete sense of the

word, if "consultation" with the electorate extends purely to regular elections. "A society is more or less democratic, according to Durkheim's terminology, to the degree that there is a two-way process of communication between the state and other levels of society." (Giddens, 1971, p. 102).

Consultative processes, if they are to be credible, generally require the participation of a wide range of citizens. They need to be linked closely to the policy-production system of government if citizens are to be motivated to contribute.

Government structures themselves can implicitly discourage citizen input - for example, "...administrative rationalisations and new managerial techniques have frequently increased the gap between the provider and user and diminished community involvement." (Hadley and Hatch, 1981, p. 30).

Structural inhibitors to consultation can be partly overcome through the holding of governmental inquiries which allow for public input. It has been said that "The contribution of inquiries to the making of policy is chiefly to the intelligence gathering section of the decision making cycle as conventionally designated." (Smith and Weller, 1978, p. 10). Government inquiries have a role both in receiving and in distributing information. However, in many cases they do not allow for feedback based on their reports. It is generally appropriate for governments to set aside a period for public input after inquiries have reported publicly (even when those inquiries have had a public input component) before making decisions, in order to allow for participation by persons who may not have contributed to the initial inquiry, but who may be affected by

the recommendations.

If current technologies (such as public inquiries) are used to facilitate broad-based consultation, the processes can be both expensive and time-consuming. One writer has asked: "Does our familiar western representative democratic system depend ultimately on a relatively acquiescent population?" (Higgins and Richardson, 1976, p. 11). Perhaps this may be the case if conventional approaches are used to facilitate participation; however, with new technologies consultation can be much less expensive and time-consuming. For example, "The family television set could provide the citizen with information inputs on policy options and choices, with the telephone serving as the output device whereby the votes on issues could be instantly recorded at the appropriate legislative matrix." (Henderson, 1978, p. 291).

If new technology-assisted approaches to consultation were to be used more extensively in society, eventually "...the formality of Royal Assent could be replaced by the more meaningful notion of 'popular assent', ascertained by an electronic referendum." (Elliot and Elliot, 1976, p. 188).

However, even though it could be argued that new technologies could facilitate more effective consultation, "No reform is easy to accomplish, least of all reforms which disturb privilege or vested interests held in common by all shades of political opinion." (Brennan, 1972, p. 14). If more participatory consultative processes were developed (as compared with conventional representative approaches) it could be argued that this would not be supported by many politicians, since fewer politicians would be required in the actual governing process.

In relation to consultation in the workplace (as compared with government), it could be argued that consultation beyond a token level is difficult to achieve because "The prevailing goal of many industrial designers is...to minimize human discretion and to use technology to bind the individual to the exigencies of the machine." (Elliot and Elliot, 1976, p. 32).

However, even though in the past "...technology has been used within industry as an instrument of control, manipulation and subordination by those in positions of power and authority." (Elliot and Elliot, 1976, p. 32) there is currently real potential as computer technologies become less expensive and more "user-friendly" for unions to use them to improve consultation between their members, the governing bodies of unions, and employers. Such technologies can economically assist unions in processing data (for example, related to members' views on topics) to produce focused information reports. For consultation to be effective participants need to have both access to information and the ability to generate information. "Information is...the basic currency of all economic and political decision making." (Henderson, 1979, p. 287).

"Without electronic aids, the human ability to handle only limited amounts of information tends to limit democratic decision-making to small group situations." (Elliot and Elliot, 1976, p. 287). Therefore, new computer technologies are fundamental to the analysis and production of information and to the facilitation of wide-ranging consultative processes with large numbers of persons.

In contrast to this optimistic view, it is interesting to note that, over time, control by technology and experts can become self-imposed. It has been argued that "...induced dependence on experts may lead to the ironic situation where people protest against involvement in decision-making processes..." (Elliot and Elliot, 1976, p. 103). If consultative processes are to be effective it is essential that participants have access to expertise, without being dominated by it. Only experience in participation can increase people's appreciation of their potential to make a positive contribution. Also, there is a need for citizens to have access to technologies such as systems models if consultation is to be non-tokenistic. It has been argued that "...'if systems analysis and interactive computer models could help policy makers in business and government the same techniques should be able to assist citizens and citizen groups'..." (Elliot and Elliot, 1976, p. 190).

Facilitating community access to new technologies is essential because "...if the quality of citizen inputs into public policymaking remains as it is now, meritocracy may well become the only chance for survival. Therefore, building up the policy-contribution capacity of citizens is essential for continuous viability of democracy." (Dror, 1971, p. 21).

1-6. NETWORKS

Networks are linkages of persons or institutions. The study of these linkages can be used to assist with the interpretation of social behaviour (Craven and Wellman, 1973, p. 4).

"What distinguishes human life from that of animals, according to Marx is that human facilities, capabilities and tastes are

shaped by society." (Giddens, 1971, p. 13).

Schools are a part of this shaping process, and prepare students for participation in networks - including social, political, and employment networks. "It is in the schools that acceptance and even reverence for "the system" is established and nourished." (Fantini and Gittell, 1973, p. 115).

Network analysis is a complex area, and is continually being developed. "The continuing efforts exerted to interconnect systems and to generalize network design have spawned concepts such as: network interface, layered structure of network, open systems interconnection, message delivery, message processing, and network technical administration and control." (Zuchinski and Islam, 1980, p. 9). However, the emphasis in this thesis is on social networks and the use of computer systems to facilitate these, rather than on the technical analysis of networks.

"One advantage in being a social animal is that one need not discover practices for oneself." (Skinner, 1972, p. 122). Computer networks can assist both with the communication and development of information on appropriate practices.

Partly as a result of this, computer networks have the potential to cause a "paradigm shift" in educational and general public administration. It is no longer true to say (at least in areas which computer networks have affected or have the potential to affect) that "Administrative history shows that broadly similar problems have been faced in the past, and that solutions not so different from modern solutions have been proposed." (Wettenhall, 1978, p. 14).

In order to understand computer networks one should appreciate their two key components - processing and communications - or, "In terms of global network functions, any computerized network that is geographically distributed can...be viewed logically as consisting of two subsystems, namely, a message processing and a message delivery system." (Buchinski and Islam, 1980, p. 13).

In many ways this can be compared to much of the information-processing work in which individuals are engaged - both in employment and leisure. They process and communicate information. However, their ability to do this is limited by such things as the speed at which they can read, write, speak and simultaneously consider information.

On the above point, it has been said that "An organization is primarily a device for overcoming the limited capacities of individual persons to process information and make decisions." (Morris, 1968, p. 25).

Salaman has indicated that "No understanding of organisations - and especially processes of control within organisations - is possible without some consideration of the ways in which organisations construct and use knowledge." (1979, p. 174).

In considering the relationship between networks and co-ordination it has been said that "The network processes involved in migration involve the flow of information and other resources among members of the net. But this use of networks is not restricted to new migrants; it is one of the most pervasive characteristics of networks, and an important part of processes of integration and co-ordination." (Craven and Wellman, 1973, p.

29).

Co-ordination and integration can be achieved either formally or informally. "Every complex organization has formal information flows and informal flows." (Grolier, 1979, p. 28). Informal information networks can have great significance. For example, it has been suggested that "To counter an inflexible and over-formal hierarchy, informal channels can be encouraged which get around the hierarchical barriers." (Grolier, 1979, p. 47).

The real potential for computer networks to be used to break down "over-rigid" information structures, within society at large as well as within organisations, is reflected in "Resource One, a radical computer group in California, [which] developed a random-access computer network to link citizen-action groups which share its data base on resources available for fighting consumer, environmental or social equity battles." (Henderson, 1978, p. 291).

Computer networks could also assist with devolution. One possibility would involve "...new administrative networks, with the erosion of many middle management positions as increased information transfer becomes possible without intermediary functionaries." (Dede and Bowman, 1981, p. 114).

In relation to information processing in society at large (as compared with purely institutional/hierarchical settings), "The expansion of communication and information processing capacities may have consequences of enormous social benefit or detriment to different groups in society depending on the particular direction of application of the technology, the institutional structure of controls over the technology, and the particular environment in

which it is introduced." (Melody, 1973, p. 165). For example, it has been argued that "If people can access and manipulate any piece of information without leaving their homes and simultaneously interact with other people and machines as easily as if they were sitting in the same room with them, then there would seem to be little reason for concentrating workers in large office buildings." (Kimbel, 1973, p. 149).

If the potential benefits of computer networks are to be fully realised, they will need to be applied, more than has been done in the past, to the area of information distribution systems. "Decision-makers the world over complain that useful information does not circulate, or circulates badly." (Grolier, 1979, p. 46). Also, "Very few if any nations have found an entirely satisfactory solution to the problem of circulating what the French have come to call 'grey literature', that is, the enormous mass of documents accessible in varying degrees and comprising reports by experts, preparatory studies for administrative decisions, parliamentary committee discussions, studies commissioned by the government, etc." (Grolier, 1979, p. 72). Sophisticated computer networks might be able to assist with overcoming the difficulties recognised above, for they have the ability to transmit information quickly, and, using sophisticated automated indexing techniques, to recognise who might be interested in documents.

For the information accessing and distribution potential of computer networks to be realised it is essential that they be "user friendly". Martin has indicated that "At best, a man-computer dialogue must be so seductive that the man is drawn into

it to explore, fascinated, what the machine has to offer." (1973, p. 8).

If planning for the introduction of new "user friendly" information technologies is to be effective, "...in place of thinking of a nation or society as a collection of communities we need to think of it as a complex set of overlapping networks of actual or potential communication and exchange." (Hiltz and Turoff, 1978, p. xxviii). In relation to the study of parts of networks it has been said that "The more autonomous a certain area is, the more it can be studied in isolation from the other institutions of its society and the easier it is to compare it with parallel areas in other societies." (Dror, 1971, p. 177). One word which could not be used to describe educational or public administrative systems is autonomous. This highlights the need to use a network perspective in studying them. In relation to this in the area of education Dror has said "Education constitutes a closely knit system in the fullest sense of the word. This means that the various components of the educational system are interwoven and intertwined and that it would be difficult, dangerous, and misleading to deal with any of them in isolation." (1971, p. 246).

Research has shown that:

* "The faster, cheaper, and more noise-free the communication system, the less the tendency to decentralize." (Morris, 1968, p. 28). This reflects on possible linkages between technical network quality and the likelihood of a decentralised system being developed.

* "In the last fifteen years or so, new management methods have been introduced into public administration [including PPBS and futurology]." (Grolier, 1979, p. 11). To use these techniques effectively a broad appreciation of networks as a whole is necessary, rather than purely a detailed understanding of a number of isolated components.

* "The traditional boundaries between disciplines, and especially between the various behavioural sciences and decision disciplines, must be broken down." (Dror, 1971, p. 15). This breakdown of barriers is particularly important if networks are to be comprehended as a whole.

In this section I outline the key reports which will be considered in the body of this thesis. I do not give a detailed analysis of the reports and how they relate to the key themes. Rather, I illustrate how each of these reports has components which relate to some of the key themes. A detailed comparative analysis is incorporated in the chapter dealing with discussion of the inter-relationships between the key concepts and reports.

1-7. WHITE PAPER ON STRATEGIES AND STRUCTURES FOR EDUCATION IN VICTORIAN GOVERNMENT SCHOOLS

The Victorian Government's "White Paper on Strategies and Structures for Education in Victorian Government Schools" is a very broad-based document. It was commissioned by a Liberal Government and was produced in 1988. The White Paper deals with aspects of education as diverse as directions for development in the area of building operations, and curriculum services. I will be considering five key themes from the White Paper which have also been considered in Federal Government reviews of public administration, these being:

* devolution and decentralisation (these are considered jointly in the White Paper);
* participation;
* consultation; and
* co-ordination.

Computer networking and related technologies could assist with the implementation of all of these thrusts both in educational and general public administration.

Even though the White Paper was produced in 1938 and there has since been a change of Government, it is still relevant. In particular, the broad themes which it articulated are still being followed by the new Government - for example, the emphasis on an expanded regional network to facilitate devolution and decentralisation is being proceeded with.

1-8. ROYAL COMMISSION ON AUSTRALIAN GOVERNMENT ADMINISTRATION (RCAGA)

The RCAGA was commissioned by a Labor government in 1974 and produced its' report in 1976. The Commission received over 750 submissions (Coombs, 1976, p. 4) and is the most extensive review of Federal government administration ever undertaken in Australia. Its' Letters of Patent indicate very broad terms of reference; it was charged with inquiring into:

"...(1) the purposes, functions, organization and management of Australian Government Departments, statutory corporations and other authorities and the principal instruments of co-ordination of Australian Government administration and policy; and

(2) the structure and management of the Australian Public Service." (Coombs, 1976, Letters Patent).

Without restricting the scope of their inquiries, the Commissioners were directed to consider such things as appropriate roles for Departments, mechanisms for evaluating efficiency in the APS, co-ordination in the APS, parliamentary scrutiny, accountability of public servants, internal control in the APS, centralisation, decentralisation, personnel policies, the rights of public servants as citizens, and other matters drawn to the attention of the Commission by the Prime Minister.

(Coombs, 1976, Letters Patent).

Clearly a number of these thrusts are similar to (but broader than) those included in the White Paper.

"The commission gathered its information and formulated its tasks and answers through a variety of methods, and largely as it went along: most important were formal and informal hearings, the operation of more or less expert task forces for particular problems and a wide-ranging research programme." (Schaffer and Hawker, 1978, p. 36). This approach can be compared to that undertaken to produce the White Paper, where there were broad based consultations with the community but no (publicly identified) expert task forces or a research programme.

1-9. REVIEW OF COMMONWEALTH ADMINISTRATION (RCA)

The RCA was Commissioned by a Liberal Prime Minister in September 1982 and presented its' report in January 1983.

The emphasis of the RCA was on quickly producing results related to a number of areas of concern which had gained widespread publicity and were clearly damaging the Government's reputation.

It was commissioned to look into:

* the impact of technological change on the APS;
* the increasing challenges the APS faces as a result of broadened responsibilities; and
* whether the APS as organised at that time could cope with unethical or illegal behaviour on the part of its' clients (in particular, in the areas of primary industry and taxation). (Reid, 1983, pp. 131 - 5).

The focuses on technological change, the need for new strategies to cope with increased responsibilities of the AFS, and organisational structure aspects are related to the key themes and the other key reports discussed in this thesis.

1-10. JOINT MANAGEMENT REVIEW OF ADP MANAGEMENT ISSUES IN THE AUSTRALIAN PUBLIC SERVICE (JMR)

The JMR was "...initiated by the Public Service Board [in late 1982] as a high level assessement of ADP across the Australian Public Service. The specific objectives were to:

* Identify service-wide ADP administrative and management issues.
* Consider the implications of developments in technology for the eighties.
* Analyse and assess the significance of the issues and developments.
* Recommend strategies and programs for improvement." (Arthur Andersen, 1982, p. 1).

Arthur Andersen and Co. were the project leaders for the review team, which also included officers from the Department of Industry and Commerce, the Commonwealth Schools Commission, and the Public Service Board.

The JMR liaised with the RCA in regard to the technological componet of the RCA's terms of reference.

The JMR was "...the first management review of ADP to be undertaken on a Service wide basis." (Arthur Andersen, 1982, p. 2).

Some of the key issues considered in the review included:

* the effects of ADP on managers;

* the importance of ADP for the management of government programs and services;

* the need to focus on systems not hardware;

* the rate of adoption of new technology;

* the need to consider the user perspective;

* the quantity of resources available for ADP;

* the sharing of ADP resources between departments;

* the quality of ADP resources (in particular human resources);

* the planning process for developing ADP systems;

* the special needs of small organisations within the APS;

* the role of central agencies; and

* the role of government. (Arthur Andersen, 1982, pp. 2 - 9).

Many of these issues are closely related to the key themes - in particular the inter-connecting theme of networking.

CHAPTER 2. CONCEPTUAL FRAMEWORK

The approach I have used in this thesis involves the following:

* an overview;
* a review of the related literature on the key themes and an outline of the key reports to be considered;
* an outline of the conceptual framework;
* an outline of the methodology;
* consideration of the relationships between the key concepts and reports;
* a scenario based on possible futures relating to trends and inter-relationships considered in the previous sections;
* a case study;
* an outline of conclusions; and
* recommendations.

In the review of related literature, consideration is given initially to literature related to the key themes (with no special emphasis on education or public administration). There is a special attempt in this section to develop linkages between the key themes.

The key themes are:

* co-ordination;
* devolution;
* participation;
* decentralisation;
* consultation; and
* networks.

The operational definitions used in this thesis for the above concepts have been included at the beginning of the relevant

review of related literature sections.

In the review of related literature section such specific questions as the following are considered:

* difficulties which might be faced in attempting to achieve a co-ordinated approach in a devolved environment;
* whether devolution necessarily assists with facilitating participation;
* the impact of educational and value systems on the potential for increased community participation;
* the relationship between decentralisation and skill development in managers;
* the relationship between data-handling capabilities, the quality of communications linkages in networks, and the propensity to centralise; and
* how the "network" concept can help in analysing inter-relationships between the key concepts considered in this thesis and between components in systems.

The emphasis in this thesis is on considering how various social alternatives could be introduced using new technologies, rather than on purely outlining these new technologies. Melmon has pointed out that "For some time there has been more confused discussion about technology than serious discussion about social alternatives." (Melmon, 1972, p. 52).

The emphasis in the methodology section is on explaining how the "brainstorming" technique has been used to generate a diverse scenario dealing with possible futures in educational and general public administration.

This is followed by a discussion on the key themes and reports in relation to educational and general public administrative structures and strategies. The emphasis here is on linking the key themes and the thrusts of the reports - with a special emphasis on how various types of networking could assist with the implementation of the themes. Networking as such is not considered as a separate component of this section; it is used as a conceptual linkage between the other key themes considered. In this section, where appropriate, I have linked the consideration of key concepts - for example, devolution and decentralization are considered in the same sub-section (as it has been in the White Paper [Victoria, 1988, p. 11]).

Skinner has pointed out "There is nothing to be done about completely unpredictable difficulties, but we may foresee some trouble by extrapolating current trends." (1972, p. 152). His approach does not take into account the potential use of futures techniques to generate possible futures which are not based purely on extrapolation.

In relation to this, in my "findings" section I have used the brainstorming technique to focus on the future. My results are presented in the form of a scenario relating to the potential development of educational and general public administrative systems in Australia over the next 12 years. The emphasis is on possible futures (rather than preferable or necessarily probable). The aim of this section is to stimulate thought on possible options. A central assumption in relation to the usefulness of such an approach is that the future is not predetermined - it is, to a degree, "created" - and it is thus useful to consider longer-term options in this way so that

policies can be developed which will assist with creating preferable aspects, and with avoiding negative aspects.

However, it is important to also consider restraints which might impede the implementation of such possible futures.

To assist with this, a case study is included which reviews an interview by the author with Dr Mick March, Principal, Narrabundah College in the Australian Capital Territory (A.C.T.). The purpose of this interview was to gain a senior educational administrator's views on the relationship between the key themes and the structure of the A.C.T. education system, and the practicality of implementing the scenario in a particular school. This case study creates a linkage between the possible futures considered in the scenario and the probable futures of an educational system (and more specifically a school within that system) as perceived by a Principal working in that system.

The problem statement for this thesis could be summarised as: "What effect could computer networking (and related technologies) have on educational and general public administrative structures and strategies in the 1980s and 90s?"

The first portion of this thesis is basically descriptive in nature. It aims to present information on the current situation in education (with a focus on aspects of education in Victoria) and in public administration (with a focus on the APS), with an emphasis on the key themes.

The data I have used has come from a review of related literature and through studying a number of "blueprint-type" documents relating to both of these systems.

The ERIC data base was searched using the key themes as descriptors. I also searched the subject catalogue at the National Library using the themes as search terms.

"Data" for the scenario has also come from numerous conferences I have attended dealing with technological change, futures research, and education. However, this data is purely of a background nature and sections of the scenario cannot be specifically attributed to any particular conference I have attended.

In the scenario I have attempted to focus on the key themes, to inter-relate these, and to suggest possible trends for the future.

I do not contend that the "data" I have selected for the production of the scenario could be described as completely comprehensive or has been scientifically selected to give a representative sample of the population of "data". This lack of comprehensiveness would create potential problems for construct validity if I was attempting to produce a predictive scenario

based on a complete overview of current trends. Instead, the emphasis is on developing a scenario which highlights a sample of potential futures rather than on developing a comprehensive scenario. In this context the use of non-comprehensive (or even representative) "data" is not inappropriate. Instead, the emphasis has been on selecting data which would contribute to a greater understanding of possible (as compared to probable) futures.

I have not attempted to study the Victorian Education Department or the APS in detail. Rather, I have reviewed related literature on the key themes, considered a number of "blueprint-type" documents relating to both of these systems, attempted some integration, and developed a scenario of possible futures. More specifically, I have limited the study to a consideration of those aspects of the key reports which relate to the key themes considered in this thesis.

This study is limited to the extent that it does not consider the systems as wholes, and that it does not consider historical and present aspects in great detail (apart from the six key themes). However, this limitation is deliberate and necessary in a minor thesis if it is to have any degree of depth. The aim has been to consider future options based on a number of thrusts which have been recognised as central to both systems' futures.

The "findings" section of this thesis (the Scenario) was produced by myself using the brainstorming technique on the information included in the first half of the thesis (no group of persons was involved - the ideas were generated by myself). This technique allows for maximum diversity - the emphasis is on generating

ideas and possibilities. The ideas in the scenario are not ordered in any rigorously structured fashion. The emphasis has been on presenting them in such a way as to encourage an "inventive" response from the reader. This compares with the first half of the thesis which is more tightly structured around the key themes in a traditionally "rational" fashion. I see the two halves as complementary. Dror has indicated that "Invention of new futures is an essential element of policy-oriented futures studies, as are more "scientific" forecasts and predictions." (Dror, 1971, p. 48).

A case study is then included based on a senior educational administrator's (Dr Mick March, Principal, Narrabundah College) comments on the implementation of the key themes in the A.C.T. schools system, and the practicality of implementing the scenario in a particular school.

There is a need for additional research on probable futures in these areas (using such techniques as case studies [as has been done in this thesis], trend extrapolation and modelling) and preferable futures (using such techniques as delphi to rank preferences). This thesis could be of assistance in providing a listing of possible futures which could be ranked in order of preference using a ranking technique such as delphi.

Once differences between preferable and probable futures had been identified, it would be appropriate for research to be undertaken on what strategies and structures could be used to "shift" the probable future towards the preferable one.

CHAPTER 4. DISCUSSION ON THE INTER-RELATIONSHIPS BETWEEN THE KEY REPORTS AND CONCEPTS

In this chapter the emphasis is on integrating consideration of the key themes and reports which have been considered separately up to this point.

4-1. INTRODUCTION

This chapter is divided into sections dealing with the impact of technological change on society and the need for a response from education systems to the specific telecommuncations and computer technologies which will have a significant impact, and interpretations of a number of the key themes in the various governmental reports. Networking is an overall theme linking these sections together conceptually.

4-1-1. Analysis of the impact on society of a rapid rate of change.

Educational and general public administrative systems throughout the world are experiencing a rapid rate of change. This has been recognised by administrators; in fact, a key theme running through the report of the RCAGA was "...the need for adaptability, for those in the administration to be aware of and responsive to the facts of social change." (Coombs, 1976, p. 407). The rate of technological change is increasing. Computing and telecommunications technologies are becoming more powerful and less expensive. These technologies use minute amounts of non-renewable resources and they assist with the expansion of knowledge. "Knowledge is a rather special type of resource because it has the capacity of effectively infinite expansion,

and it is enhanced by being consumed." (Webber, 1973, p. 293).

The recognition of the important impact technological change is having, and will have, on public administrative structures is reflected by the comment in the RCA report that "In commissioning us with our task the Government identified technological change as one of the critical challenges facing public administration at this time." (Reid, 1983, p. 86). The need for the Australian Public Service (APS) to keep up with technological change is highlighted in the fact that "Whether the [ADP support] systems are available or not, managers are expected to react to huge quantities of data and to use a quantitative approach to problems of administration, to the analysis of policy options and the operation of programs." (Arthur Andersen, 1982, p. 3).

The finding of the RCAGA that "...management systems of government have failed to develop adequately the informaton resources at their disposal, to integrate them fully into the decision making processes and to ensure them proper dissemination." (Coombs, 1976, p. 346), if still true, will become an increasingly glaring deficiency in a future in which computer technologies are increasingly becoming available to laymen (in the form of microcomputers and powerful computer software [such as electronic work sheet and data base packages]), to sections and individuals within government Departments (without the need under current practice to refer to a central authority because the cost of the systems is often less than that required for external tendering) and educational systems. The claim of the JMR that "In situations where management information is being provided by ADP systems [in the APS], managers often

complain that the presentation is not satisfactory for their use because the information is too detailed, with the level of summarisation and exception reporting inadequate." (Arthur Andersen, 1982, p. 31) would indicate that deficiencies identified by the RCAGA in regard to ADP management in the APS have not been overcome.

Public administrative and educational systems are increasingly becoming more open to disadvantaged groups - this includes ethnic minorities, the poor, Aborigines, the handicapped, and women. There is also an increasing emphasis on the need for young people to be able to participate in the societal decision-making process, and to be able to anticipate possible, probable, and preferable futures. Political systems are also experiencing a rapid rate of flux. This is a result of the emphasis on the need for direct participation in democracy, the need for more immediate responsiveness from politicians, and an increasing emphasis on the need for public servants to be more directly responsive to the community. As a result "Increasingly sophisticated analysis is required of possible policy options and their effects, and almost all departments now have policy groups of varying size to keep abreast of thinking in the community." (Coombs, 1976, p. 78). Such policy units are not enough if the administration is to respond effectively to community demands - "It should be realised that without a more rapid conversion to the use of computers the Service will be even less able adequately to cope with the scale and urgency of community demands." (Reid, 1983, p. 89). In this context it is interesting to note that "One recent survey estimated that 80 per cent of the manager's time is spent in 150 to 300 'information transactions'

daily." (Toffler, 1981, p. 197).

4-1-2. Need for a new educational paradigm.

Parents are increasingly demanding the right to participate in educational decision-making which will influence their children. This is partly the result of a broader societal emphasis on participation, but also relates to a failing which many parents perceive in the educational system: namely, that success in it does not necessarily result in young people gaining employment. It has been argued that "By setting up mass education systems, governments...helped to machine youngsters for their future roles in the industrial work force..." (Toffler, 1981, p. 79). This approach may have been questionable in a period of full employment; in a period of massive youth unemployment it is clear to all that there is a need for a re-direction in the education system. One possible approach to redirecting education would involve young people participating in "real world" decision-making. This approach is reflected in the involvement of young people in the decision-making processes of the Youth Affairs Council of Australia - in comparison with the more traditional approach where youth professionals tended to dominate. It is also reflected in an increasing emphasis by investigators on youth particiation. For example, the Club of Rome's book "No Limits to Learning" argues that there is a need for young people not only to be trained in "anticipatory" skills (which involve them in considering possible, probable, and preferable futures) but also to be able to use these skills in real-life "participatory" experiences. One problem with Australian youth affairs approaches is that they have increasingly enabled young people to be able to participate without supporting this with training in anticipatory

skills.

The emphasis on participation in decision-making processes is not confined to education. "Demands for participation in management, for shared decision-making, for worker, consumer, and citizen control, and for anticipatory democracy are welling up in nation after nation." (Toffler, 1981, p. 81).

There is also an increasing emphasis on both educational and more generally public administrators being more accountable for the money which they are responsible for spending. However, it could be argued that no matter how efficiently money was spent, criticism would still occur, in that much criticism "...is based on outright hostility to the size and cost of the public bureaucracy." (Coombs, 1976, p. 18).

Many of the themes which have occurred in educational administrative blueprints for the future (such as the Victorian White Paper) have also occured in more general public administrative blueprints (such as the RCAGA Report and the RCA Report). Thus, one of the purposes of this thesis is to consider how these themes can be interconnected, and to consider areas in which common approaches can be used by educational and more general public administrators. More specifically, I am attempting to consider how computer-networking technologies could be used to assist with the introduction of new structures and strategies in educational and public administration. The emphasis will be on the future - how these techniques could more effectively and efficiently be implemented with the use of computer networking technologies. I will also be considering how related techniques could assist. This analysis is particularly relevant when one

considers the results of a survey undertaken by the RCAGA which indicated that "Possibly the most universal complaint from users of the services [provided by government departments] surveyed was about the time involved: time taken to receive attention; time taken to get matters sorted out when something had gone wrong; and time elapsing before the service applied for was delivered." (Coombs, 1976, p. 128) The relevance of this study to this complaint becomes obvious when one takes into account the speed at which computer systems operate and their potential for providing services to people in their homes. However, technology alone can not be seen as a "quick fix" for these difficulties - particularly when one considers that "...recent years have seen massive, almost indiscriminate, public resistance to new technology." (Toffler, 1981, p. 161).

4-2. DEFINITION OF KEY TECHNOLOGIES

4-2-1. Telecommunications and related technologies.

This section of the thesis relates mainly to physical technologies. However, it is important to realise that "...technology is increasingly related to the development of techniques and processes for bringing about desired actions and for controlling and managing systems..." (Elliot and Elliot, 1976, p. 2-3).

The potential usage of telecommunications and computing systems to facilitate improved approaches to public administration has been appreciated for some time. For example, the RCAGA stated that in one of its task force reports (the Task Force on a Regional Basis for Administration) "...reference is made to a

preliminary analysis of the feasibility of developing an electronic information system designed to support delegated decision-making and, at the same time, to provide necessary data for central supervision and management." (Coombs, 1976, p. 53).

A number of technologies exist which could assist with the development of such information systems. I will discuss these in the following paragraphs.

Educational and general public administrators are familiar with the telephone system. They use this system for co-ordination. The telephone is convenient - it reduces the need for travel. It is so much part of administration that its role tends to be ignored. This acceptance can be compared to the attitude of many administrators to the use of computer systems - reflected in the fact that "...there is still a lingering tendency to see computers as some kind of unnecessary luxury instead of not merely desirable, but essential, tools of management." (Reid, 1983, p. 89).

There are a number of applications of telephone systems which could be used to enhance educational and general public administration. Telephone link-ups could be used for matters as diverse as meetings of subject consultants and for Inter-Departmental Committee meetings (particularly where some of the officers involved are located long distances from each other). Telecom can "link-up" up to nine telephones at a time for these meetings.

Groups can be involved at each location with the use of loud-speaker telephones (telephones with a loud-speaker and microphone attachment). This is very inexpensive when no long-distance calls

are involved and is relatively inexpensive even when they are (particularly when one takes into account the time saved in not needing to travel). Loud-speaker telephones can also be used to bring expertise into meetings when this might not otherwise be possible. For example, schools which are a long distance from the centre of a town could use loud-speaker telephones to "bring" experts from the town to speak to groups of students. They could also be used by public administrators (for example, when researching topics needing a quick response) where there is not the time available to travel to meet all the resource people with whom discussion is needed.

4-2-2. Data processing technology.

Dede and Bowman have pointed out that "The costs of computer and telecommunications hardware have fallen precipitously and will continue to plummet for at least another ten years." (1981, p. 111). In this context it is of concern that educational administrators at the school level tend not to be familiar with data-processing techologies.

As the cost of these technologies continues to decrease, there will be increasing potential for them to be used routinely for timetable development, report writing (using word processing software), and other administrative functions (in particular, those which are amenable to the use of computer packages such as data base and financial planning packages). Naturally, they will also increasingly be used in teaching - however, not just in the mathematics area (where they have tended to be concentrated in the past). Teachers in areas as diverse as English and foreign languages will be able to use computers to assist with teaching.

General public administrators often have had some experience with computers. However, this experience has usually been with large main-frame systems. In this context it is interesting to note that "From 1965 to 1977...we were in the 'era of the large central computer...It represents the epitome, the ultimate manifestation of machine age [sic] thinking. It is the crowning achievement...manned by a bunch of super-technocrats'." (Toffler, 1981, p. 179). The impact of these systems is reflected in the fact that "A number of senior managers [in the APS] have gained experience with systems which are predominately batch mode. They have had little exposure to such current technology as data base and distributed systems." (Arthur Andersen, 1982, p. 99). Systems which operate in a batch mode have often not been responsive to administrators' wishes partly because of the backlog of program development which most Government Departments face. The JMR "...found a substantial backlog of systems development work has been identified in departments and that delays of up to four years before development on some new systems can start are being forecast." (Arthur Andersen, 1982, p. 32).

This will all change. Increasingly officers in Departments will purchase personal computers (often as office machines - thus avoiding the need to go through a formal tender process). Also, with the development of fourth generation languages (which involve the use of sophisticated report generators) computer users will increasingly be developing their own systems without the need for programming support and without the need for long time delays. Toffler (1981, p. 180) has predicted that "Small, cheap machines, no longer requiring a specially trained computer

priesthood, will soon be as omnipresent as the typewriter." Also, it is probable that "...many middle-class employees may be given a terminal to use at home." (Hiltz and Turoff, 1978, p. 191). In this context it is interesting to note the comment of the Reid Report that "Particular care needs to be taken with the increased use of data processing and information systems, to ensure that concomitant audit, review, and probity verifying programs are devised and operated effectively." (Reid, 1983, p. 52). Audit requirements are often not considered when users develop their own systems using computer packages.

It is clear that both educational and public administrators will increasingly be using computers in both more applications and in new ways which require less professional support. This will facilitate the development of a more "participatory" approach to information analysis, but also could result in the development of un-coordinated approaches to information linkages.

4-2-3. Computer conferencing.

The really exciting potential comes from the linking of computer and telecommunications technologies. This potential has been recognised by UNESCO which has indicated that it perceives two major thrusts for "informatics" development - "...the proliferation of highly reliable, powerful and low-cost information processing equipment on the one hand, and on the other, the appearance of new digital transmission systems and specialized satellites which enable data to be transferred at great speed and low cost, irrespective of the distances involved." (UNESCO, 1979, p. 13).

Already central office staff in the Victorian Education

Department have access via computer terminals to massive data bases on such matters as buildings and personnel. It is probable that such data bases will be increasingly expanded and inter-linked. Also, it is apparent that there will be increasing emphasis on using computer terminals as communication tools as well as information disseminators between officers. The JMR recognised the potential power of the linking of computing and telecommunications technologies and indicated that "The potential of electronic mail is likely to be fully realised only if there are common standards between organisations as well as within them. There are thus grounds for assigning responsibility for developing Service-wide standards to one agency and asking it to begin development immediately." (Arthur Andersen, 1982, p. 64)

Communication is a two-way process, and allows for more participation than purely the dissemination of information. Computer conferencing facilitates communication, whereas many traditional distributed systems are designed purely for the dissemination of information.

As costs continue to decrease it is likely that schools will also have access to data bases dealing with such areas as community services and educational developments. The devolution of computer power in Commonwealth Departments is also noticeable - that is, the use of computers is increasingly being moved outwards to the interaction point with the public. This philosophy is reflected in the massive computer network being developed by the Commonwealth Department of Social Security.

"Computer-mediated communication systems are not meant to totally replace all other communication forms." (Hiltz and Turoff, 1978,

p. 139). For example, in public service environments there will continue to be a place for face-to-face communication regarding client difficulties which are not of a "standard" nature.

A computer terminal looks like a typewriter with a television screen attachment. It connects to a central computer via telecommunications lines. If a central computer has appropriate software it can link terminals. In this way it is possible for schools and government offices which have a high client-contact component to be linked both with each other and with central data bases. Messages from participants in such networks can be indexed according to such keys as:

* subject discussed;
* author;
* institutional affiliation;
* topic, author, or hoped-for responder to questions asked; and
* topic, name of questioner, or name of responder to questions answered.

Computer conferencing systems facilitate very rapid communication, because "Spoken word systems cannot move [information] any faster than the average talking speed of an individual in the group, whereas written word systems can move [information] at the average reading speed of the individuals in the group." (Hiltz and Turoff, 1978, p. 38).

Computer conferencing can be particularly useful in facilitating the exchange of information on good management techniques. The RCA indicated that "It seems to us that at present good practices or solutions to problems being employed in one department do not

always come adequately to the notice of others." (Reid, 1983, p. 54).

Dror has commented that "...the resources in qualified personnel, political support, span of attention, information, and the like, needed for improving policymaking are extremely scarce in most modern countries, often making even a small critical mass impossible to achieve without very effective new types of aid, which, at present, are unavailable." (Dror, 1971, p. 209). Given the features of computer conferencing, this technology could be the "type of aid" which Dror envisaged.

4-2-4. Computer conferencing applications and implications.

Computer conferencing is already being used in the United States. For example, if people own computer terminals with audio couplers (which allow access to a computer system via a telephone hand-set) they can access commercial computer conference networks. One such network is called "The Source". "The Source...makes it possible for anyone with a cheap computer terminal to communicate with anyone else in the system. The Source will...facilitate the creation of what might be called 'electronic communities' - groups of people with shared interests." (Toffler, 1981, p. 180 - 1). This network was used by the World Future Society to assist with the organising of the First Global Conference on the Future (held in Toronto in July 1980 - the headquarters of the World Future Society are in Washington D.C.).

With the rapid development of such technologies it is increasingly more reasonable to assert that "For many years our technological knowledge has been rapidly outpacing our decision

making institutions." (Dror, 1968, p. 3). This is particularly so in the area of education where sophisticated computer technologies are just beginning to make their appearance (particularly at the school level), and in general public administration where only recently has it been possible for individuals to purchase personal computers with extremely powerful processing and communications features. In such a context of rapid change it is reasonable to assert that optimal education and general public administrative policy will only be developed if government Departments establish "...units explicitly in charge of thinking, long-range policy making, surveying knowledge, and research and development about policy." (Dror, 1968, p. 53).

Some may argue that the need for new computer and telecommunications technologies is not great, and that educational and general public administrative systems are coping adequately at present. However, "The single most important standard for evaluating an activity is its optimal quality, that is, how good it could possibly be." (Dror, 1968, p. 67). Adequate performance is not enough - the aim should be for optimal quality output (particularly when one considers that resources are limited and community "wants" are limitless).

Thus, in evaluating education and general public administrative systems we should not be comparing their current state with that of the late 1970s. We should instead be considering the sort of performance which might be possible in the 1990s if technologies (both social and computer-based) are used in an optimum way. Whereas the Victorian White Paper and the various Federal Government reviews which I consider deal mainly with social or

computer technologies, I will attempt to integrate consideration of both of these technologies.

4-3. DEVOLUTION AND DECENTRALISATION

4-3-1. Interpretations in the White Paper and RCAGA.

The RCAGA argued that "...by skilful devolution and decentralisation of administrative procedures and the use of modern technology it is possible even in large and complex societies to come closer than ever before to situations where decisions can be made substantially by consensus among those primarily concerned." (Coombs, 1976, p. 126). In conformity with a number of the key thrusts of this statement, Hiltz and Turoff have argued that "Computerized conferencing can facilitate the decentralization of information exchange and decision making." (1978, p. 144).

Devolution and decentralisation are considered jointly in the White Paper which defines them in the following way: "Devolution refers to the transfer of authority and responsibility to other organisations further from the centre within an administrative or governmental system, while decentralization refers to the transfer of powers and functions away from the centre to other levels within the same organisation." (Victoria, 1980, p. 11). The White Paper indicates that in the participation exercise before its development, large numbers of groups and individuals encouraged the Government to transfer as much power as possible to the local level (Victoria, 1980, p. 11). Citizens' pressure for devolution is consistent with efficiency - "...efficiency depends upon adequate authority being devolved upon or delegated

to officers at various points of decision - indeed...the aim should be to shift the authority to decide as close to the geographical periphery and as low in the hierarchical structure as possible." (Coombs, 1976, p. 34). It is planned for this to occur in the case of education in Victoria; however, ultimate responsibility will still be maintained at the centre. "Thus devolution and decentralization of authority can proceed only in accordance with broad policies acceptable to government." (Victoria, 1980, p. 12). The RCA supports this concept of devolution and indicates that "Even though Ministers, formally or informally, devolve many of their powers to officials, subject to any statutory limitations Ministers may nevertheless enter into whatever aspects of their portfolios they wish." (Reid, 1983, p. 38). Computer conferencing, through its massive information accessing capacity, could assist in implementing this approach to devolution.

In relation to decentralisation, the RCAGA went so far as to recommend that "Arrangements for all programs which involve direct contact between a member of the community as 'client' and a member of the administration be reviewed with the object of making the point of contact with the member of the public the point of decision also unless there are unusual considerations to be taken into account." (Coombs, 1976, p. 418). Computer conferencing could certainly assist with this process. The information required to make the decisions would be provided to contact officers by computer terminals.

This situation can be compared with that where centralised systems are used in "batch" mode, which results in significant delays in feedback to contact officers.

At a recent UNESCO conference "A number of States referred to the desirability of decentralization, following experience of excessively centralized computerization which led to operational difficulties." (UNESCO, 1979, p. 30).

The concept of decentralisation is also having an impact in private enterprise - "...the term 'decentralization' has...become a buzzword in management, and large companies are racing to break their departments down into smaller, more autonomous 'profit centres'." (Toffler, 1981, p. 269).

Devolution and decentralisation in education as interpreted by the White Paper have a strong component dealing with the involvement of citizens in the educational governance process (in particular in relation to school councils: in Victoria, State schools are governed by school councils which include representatives of staff, students, and the community). Devolution and decentralisation in education have little meaning if school governing bodies do not have access to knowledge. Through computer terminals school councils would easily be able to access data bases. Where the data base did not contain the required information, they could leave a question which could be accessed by experts at the central office, or by other participants in the network. Schools could be encouraged to add their own experiences to the data bases incorporated in the system. They would also be encouraged to participate in dialogues. This would be particularly useful where one of the schools in the network has already faced a particular problem.

4-3-2 Devolution and decentralisation in schools and the APS.

Through computer conferencing, schools would thus be able to access both knowledge and expertise.

The knowledge would be within data bases. The data bases would not just be of a "traditional" nature (for example, established educational indexes such as ERIC and the Australian Education Index). Schools would also be able to access specially developed indexes of "precedents" using familiar key words. They would also be encouraged to include their own experiences in the "precedents" index.

The Coombs report argued for devolution from another perspective: that is, from the central co-ordinating Departments to Departments, and from Departments to regions. However, the thrust of the proposal is the same, and the importance the RCAGA gave to this theme is reflected in the comment that "Perhaps the most significant changes envisaged by the commission flow from our emphasis on the primary responsibility of the individual department or agency for efficient use of resources, and the consequential changes in the role of the co-ordinating authorities, particularly the Treasury and the Public Service Board." (Coombs, 1976, p. 418).

If the Service becomes "devolved" it is interesting to consider the impact this would have on central Departments. The RCA report indicated that in relation to the Public Service Board (PSB) they "...see the PSB as needing to give fresh and added emphasis to its responsibility for promoting efficiency in the Service. To carry out this role we think it is necessary for it to retain the

closely interrelated functions including ceilings and establishment administration, management improvement, recruitment and selection, and training." (Reid, 1983, p. 57).

Decentralisation was supported by both the RCA and the RCAGA - the RCA report indicated that "We think it is obvious that the span of operations of most Departments is so large that it can only be effectively managed if decision-making is decentralised. The same point was made by RCAGA...Seven years on, we stress it again." (Reid, 1983, p. 79). It could be argued that one reason more decentralisation did not occur in that seven year period was because of the limited information and communication capacities to monitor devolved operations in most Departments. Computer conferencing could improve these capacities and thus indirectly facilitate increased decentralisation. The JMR considered how ADP technologies could be used to assist with devolution and indicated that "We see a real need for a deeper consideration by departmental managers of the advantages which might accrue from dispersion of some systems to end users. Those which essentially service the end user and do not impact heavily on operations elsewhere might best be developed and operated by the users themselves." (Arthur Andersen, 1982, p. 59).

In relation to devolution in the APS, there has been some real progress in the ADP area. This is noted in the RCA report which indicated that "The Government approved new procedures for ADP acquisition in April 1981 which require departments and authorities to produce annual ADP strategic plans using guidelines issued by the Department of Administrative Services. The new procedures, by disbanding the Interdepartmental Committee

on ADP and revising the roles of central co-ordinating bodies, devolved greater responsibilities to Permanent Heads and increased Ministers' involvement." (Reid, 1983, p. 172).

4-3-3. Devolution, access to knowledge, and privacy.

Devolution at the operational level requires access to knowledge. It could be argued that one of the reasons practitioners rarely use indexes is because the material included seldom relates directly enough to the problems they face. With an integrated "data base/computer conferencing" model it is possible to overcome this problem. For example, a School Council interested in developing a community farm might first access the precedents data base for schools which have already developed such farms. In Australia there would be a number of these. Members of the School Council would then read the reports on the progress of each of these farms. This may suffice. However, members may still desire more information on a particular problem the farms are facing. If there is no specific information in the progress reports dealing with the aspects they are particularly interested in, they might direct a question to each of the schools concerned. If, however, one of the projects has obviously faced a problem similar to that which they are interested in the question could be directed to that specific school. The question would be stored in the central computer, and directed to the Executive Officer of the project next time he or she came "on line".

A key issue in terms of the use of a computer conferencing system in this way is that of privacy. In this context it is interesting to note that in the late 1960s MacBride indicated that "...hardly any aspect of government computer operations is not a threat to

the privacy of some individuals." (MacBride, 1967, p. 180). However, when considering the question of privacy one must take into account the fact that "Considerations of privacy and freedom of information are in conflict - the greater the scope of privacy safeguards the more restricted will be the range of information publicly available." (Bennett, 1988, p. 3).

To facilitate the protection of data from unauthorised access, a data base can be divided up into schema. To gain access to a schema one needs authorisation. In order for the "precedents" data base to be as frank as possible, limitations might be put on the access that central offices of government Departments have to them. Also, groups of schools or sections of government Departments could develop schema within schema which only members of their group could access.

The central office, and regional offices, might also have confidential schema which only they could access. However, this would need to be limited if the concept of devolution of power to the schools and sections of government Departments is to have real meaning. Power requires knowledge, and schemas are basically designed to restrict access to knowledge.

4-4. PARTICIPATION.

4-4-1. Interpretations of participation.

"One of the most significant trends of our time is the near-universal demand for participation..." (Botkin, Elmandjra, and Malitza, 1979, p. 13).

Henderson has indicated that "We cannot stifle demands for participation: we can only make better provision that it be

informed and orderly." (Henderson, 1978, p. 265).

Meesham has defined worker participation in management as occuring "...when those below the top of an enterprise hierarchy take part in the managerial functions of the enterprise." (1978, p. 5). The emphasis of the RCAGA was on staff participation - specifically the increased participation of staff in the operation of the APS. This compares with the White Paper, where the emphasis was on non-employee participation (in particular, parents and interested community members).

The RCAGA, which was arguably one of the most participative Royal Commissions in Australian history, reported that "...participation is not easy to organise fairly and effectively." (Coombs, 1976, p. 126).

Hawker has argued that "Hearings gave RCAGA a public presence and a certain legitimacy..." (1978, p. 52). This can be compared with the participatory processes which led up to the development of the White Paper. There were numerous complaints that these consultative processes were not genuine, that the key themes had already been determined before the process began, and that a number of key themes identified at numerous community input sessions were not included in the final report. I would not be able to comment on these criticisms; however, it is interesting to note that "...the demands for participation frequently lead officials to devote their ingenuity to devices which are imitations of or substitutes for participation - being designed rather to 'make people feel' that they are being consulted or are participating. The introduction of such pseudo-public-relations techniques can ultimately have the effect of seriously alienating

the community from the bureaucracy." (Coombs, 1976, p. 126).

Power is heavily related to participation. As a result "...effective 'participative' planning needs to adopt a 'bargaining', rather than a 'consensus' approach, concentrated at a 'grass roots' level." (Elliot and Elliot, 1976, p. 184).

Educational systems could potentially assist with facilitating grass-roots participation. Dror has argued that "...some rather drastic changes in education generally may be needed to bring the individual into policy making and to escape some of the defects of mandarinism that a meritocracy (that is, rule by persons selected only by merit) is almost always subject to." (1968, p. 18). Dror has also indicated that "...in order for increasing citizen participation to constitute in fact an improvement, changes in the quality of that participation are needed. At the very least are needed more knowledge of policy problems, better understanding of the inter-relations between different issues and various policies, and fuller realization of the longer-range consequences of different alternatives." (Dror, 1971, p. 20).

4-4-2. Approaches to achieving participation.

"Creative participation...emphasizes problem detecting, problem perceiving, problem formulating, and common understanding, and is not restricted merely to problem solving." (Botkin et al., 1979, p. 30).

Drastic changes in education (both for adults [often in a work place environment] and young people) will be necessary for "creative participation" in organisations to occur. This is partly because if staff do not participate to some degree in the

development of the goals, objectives and strategies related to their work, it is difficult for the staff to identify with them. In a broader context Nyerere has indicated that "...it is sometimes difficult for local people to respond with enthusiasm to a call for development work which may be to their benefit, but which has been decided upon and planned by an authority hundreds of miles away." (Nyerere, 1972, p. 1). This should be taken into account when considering that "...efficiency will be promoted to the degree to which staff identify themselves with the objectives to which their efforts are directed, and with the procedures by which those objectives and the related tasks have been formulated and allocated." (Coombs, 1976, p. 35). This is reinforced by the fact that "...cost-reduction methods which derive their effectiveness from greater involvement of staff in their work and a more enthusiastic approach to it rarely require additional capital costs but derive from the application of commonsense to the work environment as it is seen by those engaged in it." (Coombs, 1976, p. 45).

"Participation...refers to providing opportunity to contribute to policy development and formulation." (Victoria, 1988, p. 14). It must be recognised that providing the opportunity for participation is not enough to ensure broad-based participation. "The level of participation undertaken by any citizen will depend on the opportunities available to him, the political resources he commands, and the attitude held by society in general, for example whether favourable to interest group activity or not." (Higgins and Richardson, 1976, p. 7). It has been found that "Participatory democracy, except at the local and small-scale level, increases the influence and power of activists and can

weaken concern for the interests of the inarticulate and the unorganised." (Coombs, 1976, p. 15). It has also been found that "In many circumstances...direct universal participation is prevented. For example, the poor and uneducated may not take the time, or may be too handicapped to express themselves effectively. Or the population may expand until a town meeting becomes unmanageable, and mass media of communication, such as television, are not yet adapted to the requirements of politics." (Lasswell, 1971, p. 185).

To participate effectively, persons should be assisted to develop anticipatory skills. "Anticipation is the ability to deal with the future, to foresee coming events as well as to evaluate the medium-term and long-range consequences of current decisions and actions." (Botkin et al., 1979, p. 25).

Communications systems can now potentially be used to facilitate participation and the development of anticipatory skills. For example, in Ohio, United States, a cable T.V. system (QUBE) has been developed which "...provides the subscriber with thirty TV channels (as against four regular broadcast stations) and presents specialized shows for everyone from preschoolers to doctors, lawyers, or the 'adult only' audience." (Toffler, 1971, p. 174). The system allows people to vote on issues as they watch them being discussed on their television sets. It has been used for voting on issues as diverse as local government matters and talent quests. It could easily be used to facilitate mass participation in school governance at the local level. Consideration has been given to the development of a cable T.V. system in Australia, but in the public debate little

consideration has been given to its use in facilitating greater community participation in governance.

Computer conferencing systems could supplement the use of cable T.V. systems for such applications. Hiltz and Turoff have indicated that "The most exciting and potentially revolutionary political application of a CC [computer conferencing] system is the facilitation of the direct participation and voting of citizens on important state and national issues." (1978, p. 197).

Technology is not a necessary component for increased participation of staff in large organisations. For example, the RCA indicates that "Intelligent and able staff at junior levels should be capable of contributing useful suggestions about management and operational practices." (Reid, 1983, p. 85). All that is needed for this to occur is for procedures which have been developed by the PSB to be applied in all departments in the APS, and for these to be communicated to staff so that they are aware that their suggestions are welcome.

It might also be appropriate to consider ways of increasing public participation in the operations of the Australian Public Service. "Public directors" of some form could be considered. For example, Chamberlain has argued that "Public directors would seem to be appropriate for all corporations over some specified size." (Chamberlain, 1982, p. 94).

4-4-3. Potential role of computer conferencing in facilitating participation.

Dye has argued that participation in school governance has been restricted because "...as school issues become more complex, the knowledge of citizen school boards seemed insufficient to cope with the many problems confronting the schools - teaching innovations, curricula changes, multi-million-dollar building programs, special education programs, and so forth." (1978, p. 1-9). This has resulted in professionals playing an increasing role in school governance in the U.S. and Australia. With the use of telecommunications technologies, professionals' actions could be made more open to scrutiny. Computer conferencing would facilitate school councils gaining second opinions on actions proposed by professionals - either from other school councils which have faced similar problems, or from other professionals. Professional educators could well argue that this would lead to a highly turbulent environment. The key issue is "Who owns the schools?" There is no question, for example, that a person is responsible for his or her own body and that it is appropriate for a second opinion to be sought in relation to health matters. If the community "owns" the schools (as against the professionals who administer them) it would be appropriate to argue that the same thing should apply for schools.

The lack of access to all information has also resulted in a centralisation of power within the APS. The RCAGA indicated that "We have received evidence that many officers are unwilling to accept responsibility because of the consequences they fear may follow from making even a relatively small 'error' or from the exercise of a discretion, for example, to grant a pension, in

circumstances with which a superior may not agree." (Coombs, 1976, p. 158). If officers are to be able to take initiative it is critical that they have access to the same information as their superiors (that is, relevant to the decisions they need to take). Without such information they will have difficulty in justifying their decisions, and will tend to continue to send cases "up the line" for decisions. The RCAGA indicated that "Action [should] be taken to ensure that departmental decision makers at all levels have access to the information upon which their decisions should properly be based." (Coombs, 1976, p. 413). Computer conferencing systems could economically provide for the provision of such information, and thus indirectly assist in building up the confidence of officers at the client interface level in their ability to make decisions without the need to regularly consult with senior officers because of uncertainty resulting from a lack of information.

The continuing importance of public servants who work directly with the public having sufficient information to make speedy decisions is highlighted by the comment that "It is doubtful whether the hiatus between the public and the bureaucracy identified by the Coombs report has diminished in the five years since the Report was published." (Chapman, 1982, p. 20).

4-4-4. Barriers which need to be considered when it is desired to increase participation.

Lack of information is not the only barrier to participation; such things as language difficulties, location (for example, if a person is in prison), handicap, poverty, and geographic isolation can all restrict participation.

As indicated by Lasswell (1971, p. 185) the poor may not be able to take the time to participate. For example, they may be working long hours in poorly paid jobs. With telecommunications people would be able to participate at a time convenient to themselves (assuming they are subsidised - Hiltz and Turoff have indicated that "Whenever a useful new technology is developed, one policy question that should be vigorously pursued is how to make it available to those who cannot afford to buy it themselves." (1978, p. 167)). For example, with computer conferencing one can input a comment into a discussion at any time. When others in the network access the discussion, they read the comment and respond. Instead of taking two hours for a meeting, a few weeks may be spent on the discussion, but this approach has the advantages of allowing for;

* greater participation; and

* more time for reflection - one does not need to immediately respond.

Another barrier to participation is that of language. Computers are gaining increasingly more sophisticated interpreter capabilities. Eventually it is likely that a computer conference will be able to take place with people inputing ideas in their own languages and having these translated into as many languages as required. This can be done manually now; but translators need to be used to regularly key-in translated comments.

In education such an approach would allow for students studying an issue in different countries to communicate, and for school councils in different countries to liaise. It would also enable much faster dissemination internationally of educational

innovations. In general public administration it would enable much easier communication than is now possible. International organisations such as the O.E.C.D. would need to place less emphasis on employing multilingual staff (particularly where much of the communication is in a written form).

Prisons presently restrict the ability of inmates to participate in society. Computer conferencing could reduce this restriction. It is as true for Australia as the U.S. that "...our prison system dehumanizes and neither educates nor rehabilitates..." (Hiltz and Turoff, 1978, p. 174).

Telephone link-ups can be used to break down barriers to participation which result from geographic factors. By linking this approach to the use of loud-speaking telephones, school council meetings could include people who would have trouble coming to the school (perhaps because of distance factors or embarrassment about gross deformities or their physical or social difficulties). Other technologies could also be considered - for example, the school council meeting could be broadcast over community radio and community members could then be linked-into the discussion (and broadcast) through a telephone link-up. A wide variety of "resource" people could also be linked-in using this technique (which I term BOR - Brainstorming on Radio). As broadcast technologies continue to decrease in cost this approach should become an increasingly viable option, especially for large school districts.

The BOR technique could also be used to facilitate public participation in discussions on government programs.

4-5. CONSULTATION

4-5-1. The White Paper's interpretation of consultation and the potential use of Videotex to assist with consultation in education and public administration.

Another key theme of the White Paper is consultation. "Consultation with regard to the management of public education refers to the process of sharing information with and securing feed-back and comments from participants and from community interests." (Victoria, 1980, p. 16). Many of the submissions in the lead-up to the development of the White Paper referred to "...the need for schools and for administrative agencies to provide more detailed information to parents and communities with regard to objectives and programmes." (Victoria, 1980, p. 16).

Currently the Victorian Education Department publishes annually a booklet outlining the objectives and programs of schools in the State. With the use of a Videotex system such a booklet could be updated on a daily basis. Videotex allows people to access hundreds of thousands of pages of information in a data base through a key pad next to their television set. The information is displayed on the television set. Communication with the data base is carried out through telephone lines. Such a system has been in use in the U.K. for a number of years. It is mainly used for commercial information. As this system gains greater use in Australia there will be a real need for educators and other human service professionals to pressure the government to ensure that a portion of the space is allocated for community information.

As well as being able to access information about the objectives and programs of their local school via such a system, community

members would also be able to access information on such things as:

* short courses being offered over the next month in their area;

* areas in which volunteers are needed;

* proposals which other community members have put forward for the school (and scheduled meeting times to discuss them);

* profiles of new teachers at the local school; and

* information on the school budget and any budget variances.

Videotex systems could also be used as a supplement to annual reports by Commonwealth Departments. "The annual report should be a vehicle by which Departments furnish an account of their activities and performance in terms of ministerially approved goals and objectives." (Coombs, 1976, p. 75). The RCAGA argued for there being "...further development of the practice of departments preparing annual reports. These should include references to developments of significance and to issues, together with financial and staffing information." (Coombs, 1976, p. 414). With Videotex a broader version of the departmental "annual report" could be produced on an up-dateable-daily basis. It would include the types of information included in annual reports but also:

* contact points for complaints by the public, and access to information;

* information on proposed new programs;

* new contact points in the department;

* daily updates on current issues affecting the department;

* daily updates on staffing levels;

* information on any new functions;

* statements by new Ministers; and

* regular evaluations (with some outside involvement - one approach might involve the use of parliamentary committees as a supplement to cross-departmental evaluative task forces) of the Departments' performance with information on how the Department plans to improve on weak points identified. Much of this information would be produced automatically via the Departmental computer conferencing network.

The JMR in part recognised the potential for innovative uses of videotex technology when it indicated that "Videotex will permit the storage and reference of important manuals, reports, directories, instructions and policies. These would be available for use both within the Service and for the public." (Arthur Andersen, 1982, p. 15).

4-5-2. The use of television and telecommunications technologies to assist with consultation.

The Victorian Government accepted the notion that there is a need for "...more frequent consultation, involving many more individuals than merely the members of school councils and other official advisory bodies." (Victoria, 1980, p. 16). A Videotex system could assist with this process. However, other technologies considered in this paper could also be of great assistance. It is important to also use currently available technologies as much as possible to facilitate the consultative process. Dror has indicated that "Policy sciences must develop new formats for presenting and analyzing public issues in the mass media of communication in ways conducive for the formation of informed individual opinions." (1971, p. 21).

Already the Victorian Education Department has been given, free of charge, time in the morning to show films on a commercial T.V. station. Television shows could be developed around issues of pressing concern (such as the need for a core curriculum, and sex education). Participants involved in these issues could be filmed in dialogue over a number of days. The danger with attempting to develop a show out of a two or three hour dialogue is that any consensus reached tends to be forced. By integrating a SEARCH format (involving, amongst other things, completely open dialogue over a number of days) with film, it should be possible to capture a number of viewpoints, and possibly expose the public to innovative syntheses of viewpoints which are generally considered to be opposing.

Other resources could also be used. For example, the Council of Adult Education in Victoria has conference telephones in a large number of its country centres. These could be used to allow people in the country to dialogue with key decision-makers within the Victorian Education Department on a regular basis.

These could also be used to assist with involving country people in evaluations of APS activities in country areas.

4-5-3. Consultation could be facilitated by the more imaginative usage of currently available technology.

I would emphasise that I am not just advocating the use of new technologies to facilitate consultation. I am also advocating the more imaginative use of currently available systems. Toffler has indicated that "...techno-rebels contend that technology need not be big, costly, or complex in order to be 'sophisticated'."

(Toffler, 1981, p. 164) Thus, loud-speaker telephones should not be seen as just a medium for delivering instruction to country students. Television should not just be seen as a one-way transmission medium. Paradigms must be exploded if resources are to be used in the most efficient fashion. To assist with this process it is essential that educators and general public administrators consider:

* schools;
* government departments;
* themselves;
* students;
* technology;
* society; and
* buildings

as multi-purpose rather than single purpose units.

Thus a school could be used as a home, a home as a school (as in the case of "School of the Air" in remote areas of Australia), a hospital can be a library (a "resource centre" might be a better term in this context), and a teacher can be a member of a task force carrying out research as well as a learner in an experiential learning project.

This multi-purpose perspective is reflected in a submission to the RCAGA which indicated "...that departments should become more accessible to the community by becoming a 'learning resource'." (Coombs, 1976, p. 144).

Consultation in which new approaches are proposed by the community will only be effective if educators and general public administrators adopt a flexible approach.

4-6. CO-ORDINATION

4-6-1. Co-ordination, communication, and control.

All of the approaches I have considered in this thesis need to be efficiently co-ordinated.

There is great potential for innovative approaches to co-ordination involving the use of communications technologies, since "Communications [technologies]...make it possible for individuals to operate from almost anywhere and for societies to be controlled from almost anywhere." (Ferkiss, 1972, p. 31).

Co-ordination becomes more, not less, important in a period of rapid change and turbulence. Co-ordination involves "...the regulation or adjustment of activity or functions in order to secure greater overall harmony and consistency, to achieve greater efficiency and a more desirable balance, and to avoid unnecessary overlap and wasteful use of scarce resouces." (Victoria, 1980, p. 17).

In order to achieve a co-ordinated approach it is important that no more change than is necessary be introduced into administrative structures. The RCAGA report indicated "...that more conscious thought and rigorous examination should be given to proposals for administrative change, because they are almost always costly in both manpower and money and often damaging to departmental and staff morale." (Coombs, 1976, p. 387). In view of the number of Departmental mergers and break ups since 1976 at the Commonwealth level one could well question whether the Government took notice of this advice.

Co-ordination of communications and influences is critical in all administrative contexts. For example, the RCAGA found that "Senior officials...are finding that they must be prepared consciously to work with a pluralist range of influences on ministers and perhaps even to see their role as being primarily to organise those influences, so that, while ministers are exposed to the widest choice of advice and of options, they are helped by their officials to assess and give appropriate weight to them." (Coombs, 1979, p. 15).

These influences must be channelled through organisational structures by officials. "Organisational structure involves limits on members' decision-making. As such it is an essential form of control." (Salaman, 1979, p. 51). However, improved co-ordination does not necessarily involve a need for greater "control". For example, particularly in high-priority areas, there will be a need for experimentation in relation to organisational structures. A number of approaches will need to be tried at once. Duplication could be classified as "necessary" in such cases. This is because "One very interesting feature of an optimal policymaking structure is that it should be rather redundant: the contributions to the various phases should duplicate and overlap each other...The correct criterion should be that the more critical a certain policy is or one of its phases is, the more redundancy should be provided as a way to minimize the risk of mistakes..." (Dror, 1968, p. 211). Naturally, the various approaches implemented should be evaluated and the results recorded so that the system can "learn from experience". "One of the amazing weaknesses in much contemporary public policymaking is that there is no systematic learning from

experience. Very few evaluations of the real outcomes of complex policies are made, and there are even fewer on which improvements of future policymaking can be based." (Dror, 1968, p. 274).

4-6-2. Evaluation, feedback, and self-correction.

The potentially important role of evaluations in resource allocation decisions is refected in the comment by Hadley and Hatch that "The evidence from evaluations of professional interventions in education, health and social work hardly serve to explain or justify all the resources which have been devoted to them." (1981, p. 2).

However, if evaluations are to serve their purpose it is critical that action be taken based on the results of the evaluation (if the recommendations are accepted by the responsible Minister). The RCAGA argued that this could be facilitated in the case of government Departments by ensuring that "Where the parliamentary committee primarily concerned with administrative efficiency reports critically or adversely upon the activities of a department or agency, or in relation to matters which are peculiarly its responsibility, the department or agency should be expected to report directly to the committee on action taken or proposed to be taken in response to the committee's comments and recommendations." (Coombs, 1976, p. 417).

The need for action to result from evaluations is highlighted when one considers the large amounts of money which are being invested in such programs as transition from school to work. These are co-ordinated at the State rather than federal level. With computer conferencing it would be possible for people trying

out similar approaches in different States to keep in touch on a "real time" basis. Also, information on evaluations of different approaches could be readily available, together with expert advice from both the evaluators and the implementers of the program.

Co-ordination is also related to efficient communication and feedback - "...policymaking must have highly elaborate and efficient communication and feedback channels and mechanisms in order to operate, especially to operate optimally." (Dror, 1968, p. 194). Increasingly this feedback will be of a "self-correcting" rather than "central authority directive" nature. The more quickly schools and area offices can get information, the more quickly they can co-ordinate their activities for optimum results. Telecommunications technologies (in particular computer conferencing) allow for speedy information transfer, and for iterative feedback (that is feedback over a number of "rounds" as the system assists with self-correction). Such "self-correcting" feedback is important if responsibility is to be effectively devolved within government departments.

In the context of APS administration, "self-correction" refers to the use of feedback to correct procedures as close to the operational level as possible. For example, "exception reports" would be directed both to those responsible for administering programs as well as those in central offices responsible for following up on extreme exception conditions. In this context it is interesting to note a current use of exception reporting in the APS - "...the use of ADP to detect from departmental records atypical occurrences in the servicing of patients by doctors." (Arthur Andersen, 1982, p. 32). Implementation of a "self-

correcting" philosophy in such a context would involve the reports being distributed to both regional offices of the Department of Health and a central policing unit. The policing unit would only become involved if the regional offices failed to take appropriate action.

4-6-3. Co-ordination and broad-based systems linkages.

In relation to co-ordination of data, the JMR indicated that "We see scope for greater co-operation between departments which use common data, for example in unemployment and welfare areas." (Arthur Andersen, 1982, p. 63).

Co-ordination of data in education will not only involve liaison between the school and other traditional educational institutions. It may also involve them in linkages with social units as diverse as the local police and the local employment office. Naturally, this implies a need for such agencies to be linked into the educational computer-conferencing network. Increasingly, such agencies are part of semi-open networks incorporating computer networking. However, these are generally one-way systems. For example, they may involve the police using their computer system to check whether a car is stolen. The idea of linking schools into such networks for co-ordination purposes raises profound social questions. It may result in more co-ordinated education systems, but it might also result in a world in which one is followed from birth to death by electronic tentacles.

The technology itself is not the danger - the danger is that it may be used in inappropriate ways. If the police could access

school records, for example, there would be clear dangers to privacy. The technology could be designed to ensure that this could not happen - however, discussion would need to take place *before*, rather than after, a "Network Nation" developed as to the limits to which educators would allow their network to integrate

CHAPTER 5. A SCENARIO

5-1. WHAT WILL THE SCENARIO DISCUSS?

Martin has argued that "Data transmission may become as indispensible to city-dwelling man as his electricity supply. He will employ it in his home, in his office, in shops, and in his car. He will use it to pay for goods, to teach his children, and to obtain information, transportation, and items from the shops; he will use it from his home to obtain stock prices and football scores; he will use it to seek protection in crime-infested streets." (1973, p. 9).

This scenario is designed to consider ways in which systems (both educational and general public administrative) could change over the next twelve years with the use of modern computing and telecommunications technologies. There is a focus on the other themes considered in the first part of this thesis where appropriate.

In this scenario I have attempted to integrate consideration of educational and public administrative aspects wherever appropriate.

Wherever I write of periods up to (but not including) 1984 the events described have actually occurred.

Wherever I speak of 1984, or further into the future, the discussion is purely "possible", and should not be considered in any way "probable" or necessarily 'preferable" (at least from my point of view). The emphasis is on highlighting possible futures in education and public administration of which policy developers should now be aware and for which they should be planning (or

against which as the case may be).

EDUCATION

5-2. USE OF COMPUTER PACKAGES IN EDUCATION

The year is 1995. Typing has been part of the core curriculum in government schools for five years. Students are beginning to use terminals for simple communications tasks in primary schools. In secondary schools, students have been using computer packages on a wide scale for around ten years. These include data base and financial planning packages. Since 1985 there has been little emphasis on teaching programming techniques to students. The emphasis instead has been on teaching them to use computer packages, because it is recognised that it is not economical to actually design and program systems "from the ground up" in most real-life situations. Computer packages have become more economical to purchase as a result of economies of scale factors. The emphasis in both public and private administration is also on using prepared packages and higher-level languages rather than on developing customised systems. Packages are required by law to include self-instructional material.

There is however, much work also done in teaching computer professionals new techniques for programming, program modification and adaptation, and program juxtaposition (this involves the simultaneous running of more than one program and the selective synthesis of components from these).

5-3. NEW ROLE FOR SCHOOLS AND PUBLIC LIBRARIES

Computers and communications networks have had a significant impact in facilitating a change in role for schools and public libraries. Many children who previously went to school now learn at home, using terminals at least 50% of the time. Libraries are seen as information-search training institutes rather than purely as depositories of information. Computer terminals (for use in local communication and international data-base searches) are available in all schools and public libraries. Initially a number of schools could not afford to access international data bases, but the Government developed a special "Disadvantaged Schools (Information Systems)" program in 1990 to assist such schools. This was administered by the Commonwealth Schools Commission.

All major libraries have had international access to world-wide information systems since the mid-1980s. At that time there was a debate over whether data-base access should be provided free to individuals in libraries. This debate became less relevant as all key community information became available on Videotex systems (the community information section of the national videotex system established in 1985 was funded by the Government), and as the cost of access to data bases (both in Australia and overseas) became less expensive (as a result of new approaches to communication involving the compression of information and digitalisation of information). The additional national satellites have greatly benefited this access.

Access to data bases has come to be seen more and more as a right in a democratic society (that is, if all persons are to have the potential for effective participation in societal decision-

making). Some commercial data bases are still expensive to access; these are generally of a kind which have both a limited potential audience and for which the development costs have been extremely high (access to these data bases is on a "user pays" basis).

Libraries still provide conventional services, but the emphasis is very much on how to use technologies to gain access to information (as is traditional; for example, how to use index systems) and also on using technologies to process information (this was an innovation - for example, free courses in how to use financial planning packages were available in all central State libraries from 1985) and how to lobby for change based on the results of information processed (the role of libraries as facilitators of change became particularly strong in the late 1980s when it was increasingly realised that many of the studies carried out by individuals were not having an impact on societal decision-making processes, because many of the individuals and groups who undertook them lacked lobbying skills). Wherever possible, self-teaching courses are used as a supplement to face-to-face teaching in libraries.

Librarian roles have been expanded to include basic technical skills required for the maintenance of the extensive range of computer and related electronic equipment which is now as common and integral to library operations as are books and audio-visual equipment.

School libraries have increasingly taken on a community orientation. Most school libaries now provide services to the community, particularly where there is no public library in the

area.

5-4. INNOVATIVE APPROACHES TO EDUCATION

An increased community orientation in education is reflected in parents now playing an integral part in the education of their children. Many children stay at home to learn from parents who in the majority of cases now also work from home. The progress of these children is monitored both technically and personally by teachers with whom the children meet face-to-face every few months.

Students also regularly dialogue with their friends (both in Australia and overseas [sometimes using computer translation packages provided with computer conferencing facilities]) through terminals. They do, however, go to school on a regular basis for general socialising activities and to participate in small business activities. A number of schools now lease space to groups of students who are involved in the development of computer software, the sale of art works, and action research activities (often dealing with youth-related topics).

In some locations, there are as many parents as children enrolled in formal educational programs. Partly as a result of this, parents also use terminals for learning activities.

There is a general awareness of the need for learning to be a lifelong process, and for retraining to occur regularly throughout a person's life. Career educators are used to assist both young people in transition from school to work/higher education/unemployment/self-employment, and older persons in transition from work to retraining, to new types of work or into

constructive and rewarding retirement.

5-5. APPROACHES TO CAREER EDUCATION

Career education starts for young people at a very early age. They often watch their parents at work on computer terminals in the home. This compares with previous situations where the parents' work was not visible to the young. In a sense this reflects a return to more traditional work forms. The young and old have access to volunteer "mentors" from any profession or trade in which they have an interest.

Mentors have been used in the APS as a career development tool since the mid-1980s. They supplement other approaches to broadening the vision of up-and-coming executives (such as executive interchanges). There is a special emphasis on providing mentors to disadvanted groups (for example, new female financial executives might have a female mentor who is the Head of a Financial Planning Branch in another Department). To avoid any possibility of influence being used to assist mentees gain promotions (actual or apparent), mentors may not sit on their charges' interview panels.

Some mentors are either wealthy philanthropists or retired persons - with both professional and trades backgrounds.

Various businesses have opened their data banks in a limited way to schools and other learning institutions (as well as to public administrators who increasingly do "Executive Exchanges" without leaving their work place for long periods: they do them via their computer terminal, [either at home or at their work place]). The opening of data banks has allowed young people and others to

observe businesses and professions in operation. This is an extension of a system termed "Adopt-a-School" which was developed by the United Bank of Denver in the late 1970s. This involved Branches of the Bank adopting local schools, acting as a contact point for speakers on business-related topics, providing tours of their branches to the school, work-experience opportunities, and possibly a representative on school councils. The opening of data banks is limited: students only have access to daily "executive summary"-type reports which previously would have been included in annual reports. However they do also have access to a number of decision-makers whom they can question via their terminals.

These techniques have highlighted to both young people and educators the broadening range of skills which persons need in order to be effective in business and professional environments. There is little talk of a need to "return to basics"; the emphasis is now on redefining the notion of basic skills in a society in which everyone has access to word processing packages which can check spelling and grammar, and financial planning packages which can assist with the modelling of numeric problems (and naturally also with the calculations involved).

These techniques have also had enormous benefit in the areas of vocational guidance and training. Students in schools can "monitor" in great detail the work of surgeons, engineers, draughtsmen, computer technicians and so on. The world of work is directly accesible to every child in every school.

5-6. COMMUNICATIVE COMPETENCE

Communicative competence is seen to be a much broader concept than simply the ability to communicate effectively both in

writing and verbally. It is now seen as incorporating the ability to:

* identity issues;
* design ways to gain information;
* process information;
* lobby for change;
* understand power structures;
* use various types of communication media; and
* understand which media should be used for different purposes and how to design messages for maximum effectiveness.

The need to broaden the meaning of communicative competence was highlighted as it was seen that merely providing access on a large scale to such things as computer packages, and computer conferencing facilities, was insufficient for individuals to be able to use these technologies effectively. It was seen that it was necessary for these technologies to include a training component in their introduction.

The APS was one of the first to take up the challenge of this in the mid-1980s. It introduced courses on such things as:

* using word processing software;
* integrating financial and word processing software for maximum impact;
* communicating from home using computer terminals;
* inputing information into Videotex systems for maximum effect;
* using cable T. V. to gauge public perceptions on governmental programs and proposed programs;
* finding appropriate uses for computer networks as a

supplement to face-to-face communication;

* developing innovative uses for loud-speaker telephones in administration and policy development.

Education departments also took up the challenge. They developed special programs for young people. T.A.F.E. systems were involved in running broad-based communications programs for adults.

The running of such innovative programs (which are relevant to all age groups), and the emphasis on lifelong education, has led to a greater awareness of the need to keep accurate records on the development of competencies by students throughout their life, in order to ensure that they gain maximum benefit from the educational programs which they undertake.

5-7. NATIONAL EDUCATIONAL DATA BASE.

Teachers can easily access information on the background of their students (a national data base on students is kept which is linked to an international data base), innovative educational programs, evaluation of programs and professional development opportunities.

The data base on students is similar to one developed in the United States in the 1970s. It was decided that a similar data base was needed in Australia because of the increasingly common national and international mobility of students. In the late-1980s it was decided to link-up national student data bases so that students who were internationally mobile could have their records accessed. Some students were also mobile through their terminals. For example, by the late 1980s some students who had a strong grasp of French were being taught in the French

educational system even though they lived in Australia. This had advantages both for migrant children, and for children who were especially gifted in languages and in relating to different environments, but who could not afford to travel. The data base allowed foreign schools to have an evaluation of a student's strengths and weaknesses, and minimised problems caused by changes between educational systems (across both States and countries).

Studies in politics, social sciences, botany, biology and geography have also been transformed with this new technology. Students can, for example, experience the realities of life in Central Europe while physically being in their homes or classrooms in Australia.

National and international visual linkages are now economically possible for educational purposes. These allow for the display of still imagery, with changes possible at regular intervals. "Continuous movement" visual conferencing is relatively expensive, and is still only routinely possible between capital cities using optical fibre linkages, with the aid of studios especially set aside for this purpose. This is because it is far too expensive to hire the band-width required on satellites or normal telephone lines to allow for "real time" visual conferencing. The transmission of still visual information via satellite has enhanced the teaching of numerous subjects in the "School of the Air", and in adult training programs beamed to isolated areas. The technology to do all of the things considered in this paragraph had been available for over twenty years; the key new factor in 1995 was the continuing dramatic reduction in cost of all but "continuous movement" video conferencing.

"Continuous movement" video conferencing has been used for linkages in high priority areas (such as emergency medicine in isolated areas) in Australia, but authorities have discouraged its use in other than emergency situations because of the large amount of band-width required, compared with such approaches as audio or terminal-based conferencing.

Research is being undertaken into how linkages could be developed between Cable T.V. systems, optical fibre cable networks (between States), and new "broad band-width" satellite systems to allow for economical small-scale educational usage of "continuous movement" video conferencing systems on a large scale over great distances.

All teachers and educational administrators have their professional interests recorded in a data base and are notified of professional development opportunities by the system. This is an extension of a more focused approach to information dissemination which has been made necessary as access to masses of information has become more economical. For example, the Victorian Education Department in the early 1980s started producing a listing of conferences indexed according to subject areas. Previously this listing was produced purely in date order. In a sense this was a forerunner to more advanced approaches, in that it recognised that educational professionals are far more likely to use professional development information tools if they can access areas of interest to themselves directly without needing to wade through large amounts of irrelevant data.

Where cost or time is a factor, teachers can attend international

conferences via their terminals while remaining in Australia. Needless to say, this does not fully accomodate the social intercourse benefits of in-person attendance.

5-8. DISTANCE EDUCATION

The National Educational Data Base has assisted in the running of better distance education programs. It has meant that students who move frequently around Australia have a continuous record kept on them, which can be accessed by teachers in new locations.

There was some talk of organising a National Distance Education School, but this was resisted by the States and NT. Instead, there is very close contact between distance educators in each State and the NT, facilitated by satellites. Pilot programs for such liaison began in the early 1980s using the Intelsat Satellite.

It has been found that satellites have been useful for other distance education programs. Teachers who were previously not able to attend national conferences because of distance regularly participate now via audio-satellite link-ups. This was often possible before the advent of the domestic satellite using terrestrial linkups, but it was found that the availability of the satellite both allowed for the participation of teachers in areas with no conventional telephone access, and tended to "raise the consciousness" of professional development personnel regarding the options available.

5-9. ADULT EDUCATION

The availability of satellites has also assisted with adult education in isolated areas. The need for retraining for adults has been generally accepted, but problems did arise in implementing this concept in isolated areas with limited communications linkages.

Now all Technical and Further Education authorities have developed programs which include mastery learning sequences and linkages via terminals for interaction. These programs can be transmitted either via terrestrial linkages or the domestic satellite.

All professional associations now have requirements for continuing professional education if a member is to maintain his or her standing. Continual up-dating is essential, because changes occur so rapidly.

The Australian Public Service continues to encourage its members to undertake study leave related to their work and in certain areas has begun to direct public servants to do so if they wish to retain their substantive positions. In the mid-1980s an innovative form of this approach was developed incorporating the concept of permanent part-time work, and a lifelong education philosophy. This allows officers to work one year, then take a year off, then work another year for a pre-determined time. It has been found that this approach has advantages over the traditional approach of giving large blocks of time for study leave. Officers participating in this scheme are also allowed to undertake some consultancy work during their study leave. It has been found that this has real advantages for officers undertaking

such degrees as the Ph.D. and new Te.D. (Doctor of Technology). It has meant that the officers maintain contact with the APS. There are also tax advantages in spreading the periods of no income over time, since this allows for an "averaging of income" for tax purposes which does not occur when large blocks of study-leave are taken.

The APS particularly encourages this approach for officers who need to keep in touch with both the APS and the business world if they are to remain at the cutting-edge of their fields (for example, data-processing professionals, long-range policy analysts, organisational consultants, and adult trainers).

With approval, some of the officers have continued with this program after gaining their higher qualification. This has diminished the financial disadvantages of being in the APS for those officers who work in fields which are very highly paid in the private sector, in that one year in two can be spent in consultancy activities. Naturally, there are significant restrictions on officers involved in this program to ensure that there are no conflicts of interest.

AUSTRALIAN PUBLIC SERVICE

5-10. NEW EDUCATIONAL ROLE FOR PUBLIC SERVICE BOARD

Since 1984 the PSB has been conducting extensive training courses on the use of computer packages for public servants. The impetus for this resulted partly from the finding of the JMR that "Modern system development tools including very high level languages (ie non procedural and user oriented) are not in common use [in the APS]." (Arthur Andersen, 1982, p. 2). Politicians have

increasingly been encouraged to participate, as it has been recognised that "...upgrading the professionalism of senior administrators while leaving the capacities of politicians and political institutions low will change the balance of power between administrators and politics in directions which may often involve undesirable alienation and de-democratization." (Dror, 1971, p. 269). There has been a particular emphasis on decision-support systems, particularly systems designed to assist with quantitative analysis, the development of models, and systems designed to produce reports efficiently. This emphasis coincided with a shift in policy towards part-time work. From 1985 public servants who wished to work from home and were involved in clerical-type or policy work have been allowed to do so for 50% of their time. This has been particularly helpful as an equal opportunity measure. It has meant that a number of men, who otherwise would not have been able to, now work from home and contribute to child supervision. It also has broadened many womens' options. There are many families in which "...man and wife split a single full-time job." (Toffler, 1981, p. 227).

The PSB developed a tender document in 1984 for micro-computer systems with communications capabilities which allow officers (with approval) to work from home. The Public Service pays for half the cost of these systems and the public servants using them pay for the other half.

5-11. CUSTOMISED STATISTICAL REPORTS

The general availability of terminals has had other effects.

Statistical reports are rarely made available in a hard copy format (that is, on paper). This is because all executives now have access to computer terminals. Also, as the amount of information available became more and more overwhelming, it was seen that to provide all the information which executives needed in a paper form involved much redundancy. The emphasis now is on having customised reports produced around the parameters which executives specify.

This has also had an impact on education, and on adult training in the APS. Just as calculators changed the emphasis placed on repetitive calculation in schools in the early 1980s, computer packages have had an effect on the emphasis placed on students producing tables manually in schools, and on learning computer programming. Since the late 1980s there has been a dramatic change in mathematics in schools and APS training programs. A new form of mathematics called "information analysis" has been introduced. This involves students using quantitative and non-quantitative data to produce reports. There is little emphasis on students producing reports themselves from the "ground up"; the emphasis is on students setting parameters which computer packages use to produce "skeletons" of reports. Students need to "flesh-out" the reports produced by the packages. Packages are now available which interact with the students and assist them in defining the parameters of the reports. Similar packages have been in use in the APS since the late 1980s.

5-12. INFORMATION CO-ORDINATION

The new types of statistical packages have had a significant impact on the APS. For example, reports which could not have been produced in the early 1980s are now regularly prepared with the assistance of packages. Freedom of Information reports have been much easier to provide. In the mid-1980s there was a proliferation of micro-systems in all Departments. By the late 1980s this was controlled through the use of "information co-ordination plans" which recognised the value of data and planned for it - as with the other resources of the Departments. By 1990 it was generally recognised that information systems had become so powerful that the "information co-ordination approach" needed to be taken across the APS. This emphasis on a need for a Service-wide approach to information seemed to be an extension of the approach of the Committee on Integration of Data Systems, "...which reported in 1974...[suggesting] that efforts be made to ensure that official data systems...[were] mutually compatible." (Coombs, 1976, p. 349).

5-13. FREEDOM OF INFORMATION

The need for compatability of information systems has been highlighted by the trend to interpret the concept of Freedom of Information more broadly than in the 1980s. This is because of the decreased need to use expensive manpower to search out information. Much information under the Freedom of Information Act is gained directly through computer terminals. This means that advocacy groups often follow the development of legislation and regulations from the early stages. Also, they follow the public administrative responses (including early drafting

discussions) through their terminals. Early attempts were made by a number of public servants to develop confidential schema on an "unofficial" basis but this has been made almost impossible by the regular scanning of computer systems by "policing software" which had been developed by the Auditor General in the mid 1980s to pick up such activities along with attempts at fraud.

Personal information is still protected under the Freedom of Information legislation. Access to adults' school records and childrens' court records are particularly restricted. Some access to researchers is allowed, but only where there is no way that individuals can be identified (that is, data is only available in an aggregate form). Where data could be used to identify individuals (for example, where the data involved refers to a very few individuals) dummy data is inserted at random in order to make this impossible. The Bureau of Statistics has used this approach for many years with Census data, and continues to research ways of preventing the identification of individuals when other data of a confidential nature is being analysed with powerful computer systems.

GENERAL ASPECTS

5-14. NEW APPROACHES TO PARTICIPATION

School and work governance is much more participatory. Young people are heavily involved in the governance of schools, particularly in the selection of material to learn outside the core curriculum. They make their selection on terminals and can make suggestions for new types of learning activities. They are also encouraged to liaise with other students and develop coalitions for change.

In government there is a significant emphasis on worker participation, with expanded staff suggestion schemes, the use of autonomous work groups, and related techniques being widely used in the APS. Computer conferencing is used to assist with the implementation of these techniques.

Cable T.V. (based on optical fibre technology) has been in operation in all major Australian cities since 1990. It is mainly used for the distribution of films, computer programs, data base access, and related information purposes. However, there has been a significant increase in educational and political documentary material on the normal Australian Broadcasting Corporation and commercial television channels, which is in addition to the two "access educator" channels - one for primary and secondary students, and the other for tertiary and Technical and Further Education students. The system is also used partly for polling groups of citizens on issues, and to facilitate the purchasing of goods from home. Appropriate guidelines have been legislated to ensure the privacy of voting "records" produced by such systems (this is necessary as a number of the issues voted upon are controversial - for example, the restriction of smoking rights to consenting adults in private). Also, if it were legal, the system could have been used to produce (without consumers' consent) detailed records on the types of goods purchased by specific households.

Citizens are encouraged to participate in various government-established task forces on societal problems. They can also access the deliberations of most government bodies (local, state, federal, and global) via computer terminals (access is via

various key terms, and responses to the deliberations can also be entered in the terminals and directed to backbenchers, Ministers, or other key decision-makers).

The use of key terms as a lobbying tool has increased. For example, some environmentalists have instructed their terminals to contact them whenever environmental issues are discussed (individuals would generally be more specific; for example, they might distinguish between environmental issues affecting their local area as compared with global issues, or perhaps they might be particularly interested in one type of environmental issue [for example, the preservation of specific areas of wilderness or species of animal]). Similarly, libraries have programmed terminals to co-ordinate the recording of television programs pertaining to a wide range of curriculum areas, using the same technique.

A number of lobbyists have developed "standard" responses to be sent to decision-making bodies when issues of interest are discussed. All of this has been made possible through the use of improved index systems of deliberations. Initially, abstracts of deliberations with key words linked to them were developed. However, as the power of computers increased, greater use was made of accessing according to every word used in discussions.

5-15. LEISURE

As participation has become easier, more and more people are participating in societal governance in their leisure time.

When word processors were still relatively uncommon, access to them gave persons a degree of power which was previously

unobtainable without significant support staff. This resulted from the ability to, for example, customise letters to a large number of decision-makers. As word processors became more common this differential in potential power became less obvious. However, the people at the forefront in using word processors for lobbying then began using data base packages to focus their lobbying for maximum effect.

By the late 1980s artificial intelligence systems were available to people to assist in leisure pursuits. These could be run on micro-computers and assisted with such things as:

* advising on political strategy;
* advising on how to relieve tension;
* medical advice;
* child-rearing advice;
* learning;
* career planning advice;
* marriage guidance;
* leisure options advice; and
* networking advice (to assist in linking-up with others with similar interests).

These systems are also used widely in the APS. They use a large amount of storage space, and it was not until the mid-1980s that it was recognised by both the management and unions in the APS that they would have a significant effect on "higher-level routine work" (undertaken by such persons as senior clerks, doctors, accountants, and other professionals) in the APS.

This was surprising when one takes into account that even in the early 1980s artificial intelligence systems were available to

assist with mineral exploration activities, and medical diagnoses.

5-16. ACCESS TO TECHNOLOGY BY THE POOR

As the power (and personal power-enhancing capabilities) of available systems became increasingly obvious, it was perceived that, if the democratic process was to continue, it was critical that the poor not be excluded from access to information, conventional computer systems, and artificial intelligence-based systems. This was initially a problem when systems were introduced, because of their few users and high fixed cost. However, it was soon recognised that the marginal cost of additional users was often not high, and that the Government had a responsibility to fund the involvment of such people in the system (free use of such systems other than in libraries [for example, in the home] was restricted to those who passed a means test).

This awareness was not immediate. In the late-1980s there was still discussion on how such facilities should be provided to the poor. It had been argued for a number of years that terminals should be made available in the homes of people who could not afford them, but Telecom had resisted this concept (or at least resisted funding of the required terminals - it had been argued that this was a responsibility of the Department of Social Security). Eventually the problem was overcome by making the provision of information terminals to the poor a national priority. A number of Departments were involved in making a Joint Cabinet Submission on this matter (a key component being a significant grant to Telecom to implement the policy) and this

was accepted by Cabinet in the late 1980s.

5-17. MONITORING OF STUDENTS AND PUBLIC SERVANTS

The question of access to information about oneself recorded in systems was highlighted in the late 1980s when the public and union members in the APS became increasingly aware of how all-encompassing were the computer systems operated by the APS and educational systems.

Educational administrators monitor the progress of teachers and students via terminals. The APS in the mid-1980s resurrected the Mandata system partly because of the need for a comprehensive Service-wide system for monitoring staff. This monitoring was partly to assist with career planning (both for individuals and Departments) but also had a component dealing with the evaluation and supervision of staff. At the more junior level the emphasis was on specific evaluation around output measures. At management levels the emphasis was on using prose comments around key themes by supervisors. Computer packages were developed in the late 1980s to assist with the interpretation of such prose comments. These packages were particularly useful in highlighting themes which occurred over a number of years in individuals' evaluation reports, or in groups of evaluation reports in Sections, Branches, Divisions, Departments, or the APS as a whole.

Computer packages are available to produce summary evaluative reports on both staff and learners. As learners are increasingly involved in real-life problem solving, and staff have a responsibility to learn, the packages are very closely related.

Initially, learning facilitators (especially teachers) and unions

were concerned about the use of such approaches. However, safeguards were developed which ensured that the systems are used to assist with the development of individuals, not purely for negative evaluative and supervisory purposes. Learners are now assisted in the most appropriate fashion possible.

With regard to staff evaluation, the emphasis is very much on evaluations being used to assist with the individual concerned; both with encouragement when he or she is doing well, and with remedial suggestions where there are problems. This means that officers with difficulties (for example, in coming to work on time, or logging-on on time) are identified within a short time of the problem arising and remedial action is generally taken quickly to ensure that the officer concerned is given assistance to overcome the problem.

The emphasis at the macro-level in these approaches is to ensure that broad policy is being adhered to, whilst allowing for appropriate flexibility for individuals in the implementation of that policy. Exception reports are produced listing only those people for whom action needs to be taken. The computer system also gives advice on the most appropriate action in such cases. For example, it might indicate that one student comes from a very poor home where there is no transport to school, and suggest that remedies be investigated when it is found that a student is consistently coming to school late. In the case of a staff member, it might indicate that an officers' spouse was dismissed the week before and so the officer would be given a warning to be on time in future, but not too much pressure would be placed on him or her at this time.

Specific controls have been built in to ensure that personal contact and interpersonal interaction are maintained. Also, the use of telephones which allow for a stationary visual component has greatly improved the "personal" touch in distance and other non-direct interactions (which is particularly important when evaluative activities are being undertaken).

3-18. SOME SCHOOLS AND GOVERNMENT DEPARTMENTS NO LONGER HAVE BUILDINGS.

In the late 1980s the government used as one justification of the need for close monitoring of citizens via computer systems the fact that a number of schools and government Departments no longer had buildings, and that in such a context traditional less-structured approaches to monitoring would not be practicable.

A number of correspondence schools sold their buildings in the late-1980s and allowed staff to work from home 100% of the time - as do their students. Some new schools were developed without buildings - particularly where there was a limited number of potential students, or where the students were widely spread geographically. Some schools which initially planned to maintain their buildings found this was almost impossible to justify as the number of students decreased. Also, some teachers who initially found the idea of working from home unattractive (because of a concern that career prospects might be limited, or that professional interaction would be cut off) soon came to appreciate the advantages of this approach and more and more are now applying for "home" rather than "school" placings.

The first Government Departments with no buildings were small ones. A number of these Departments were in areas which involved the analysis of future trends and had a heavy reliance on information in data bases and could operate without a heavy emphasis on face-to-face supervision and communication.

As the cost of space became more expensive, and the cost of communications technologies continued to decrease, the Department of Administrative Services developed a set of guidelines in the mid-1980s outlining the types of positions which could be operated from home. To the surprise of many senior officials, it was found that almost half of the policy positions in the APS had a 50% or greater component which could be done from home. This meant that some officers were working from home up to 4 days per week. This dramatically reduced the rent and overheads bill for the APS in Canberra. The effect in Regions was not felt as greatly, as much more of the staff were involved in direct interaction with the public. However, by the early 1990s more and more of the public were using their terminals for interaction, and greater numbers of Regional Office staff were able to work from home.

5-19. "TERMINAL ADDICTION" AND PERFORMANCE DIFFERENTIALS.

A problem which was not generally recognised until the mid 1980s was, that in using terminals regularly, students and professionals could over time develop extremely close relationships with the systems they interacted with, and lead unbalanced (as traditionally interpreted) lives as a result.

There has been a significant decrease in the quality and regularity of much inter-personal interaction. Some students are

described as being anti-social, having lost, or never learned, good inter-personal skills. This is a serious negative consequence of increased terminal usage which is causing educators and politicians much concern. In some areas, special classes in social interaction are conducted in an effort to counteract this problem.

A number of students and professionals have become "terminal addicts". The highly motivational aspects of using computer terminals for work and study had not been fully recognised until the early 1980s. Computer systems provide immediate feedback, and do not have personality faults. They respond to instructions immediately, assist with the clarification of needs, and have the potential for repeated testing without criticism - explicit or implied (as compared with teachers, friends, supervisors, and companions). They can also tailor the interaction to the needs of the interactor. A significant number of students are now starting Ph. D. studies before 18 years of age as a result of these factors (in particular because students can proceed at their own pace using such systems).

In the work situation such features have resulted in clear performance differentials between officers, which can be monitored by the system. This has resulted in less need for "broadband" type supervisors, and more need for supervisors who can assist with the follow-up of specific difficulties which individuals might face. One reason for the massive difference in the performance of officers is that there is now virtually limitless clerical assistance-type support (for example, in accessing, filing, checking spelling, copying, indexing, and

mailing documents). The trend towards the employment of fewer clerical assistants in the early 1980s by the APS was seen to be an appropriate step by the end of the 1980s and virtually all clerical assistant-type tasks are now being carried out by computer systems. The places originally filled by these persons are now filled by programmers, systems analysts, and other computer-related professionals, so that employment opportunities have not been lost but have been redefined. This has not reduced the career prospects of clerical assistants on the payroll. They have been able to rise through the ranks purely on ability (with a five year experience bar) since the early 1980s, and when it was perceived that there would be less need for their type of skills, the PSB made a special effort to involve such officers in retraining.

Performance differentials have resulted in some officers entering the upper executive echelons of the APS (specifically the Senior Executive Service - containing less than 1% of the administrators in the APS) in their early twenties. Initially this was seen as a good thing, as it highlighted that age discrimination (even if it had existed in the Service) was no longer a problem; but by the early 1990s it was increasingly seen that technology could provide more support than most people could cope with (that is, it was seen that more and more individuals [both students and professionals] were suffering from "burn-out" as a result of overstimulation from their environment).

From the late 1980s, to avoid addiction to terminals, students and office workers were being encouraged to participate in sport, arts and crafts, drama, and various other forms of physical and social activity. All new office buildings have provided sports

facilities and showers, reading rooms, and other facilities for physical and intellectual leisure. As many students and workers are located in their homes, this is not always of great help in getting them away from their terminals. In an effort to overcome this, research is being undertaken into new types of sports which incorporate the feedback and self-correcting aspects of terminals. Also, computer systems themselves are being increasingly designed to avoid "burnout" in operators, by "keeping tabs" on their use of the systems and notifying the operator and supervisors of unhealthy trends. Some models have built-in warning lights and buzzers to indicate to the user that a rest-time is overdue.

5-20. INTERNATIONAL TASK FORCES

Students, public servants, and other adults and young people who have the ability, are increasingly working on international task forces established by such bodies as the United Nations. A strong push for increased youth involvement in U.N. task forces resulted from pressure placed on the U.N. by young people during the International Year of Youth in 1985.

A number of private groups have also facilitated youth involvement. The Club of Rome in their book published in the late 1970s "No limits to learning" was particularly supportive of the twin thrusts of youth "participation" in society and of young people being trained to "anticipate" (possible, probable, and preferable futures). It argued that young people should not only be allowed to participate in societal activities, but should be trained in how to anticipate, so that this participation could be real and not tokenistic. Since the mid-1980s there has been an

increased use of computers to allow both for participation and training (and facilitating) in the use of futures techniques.

Telecommunications technology has made significant participation by previously non-involved persons possible at the international level. This is particulary the case at the early stages of discussion when innovative ideas are being sought.

5-21. MULTIPURPOSE SOCIAL INSTITUTIONS

All social institutions are seen as multipurpose 'rather than single purpose. Increasingly, professionals and trades people are participating in community education activities. Education is seen as a lifelong process, in which all professions and trades have a function. Also, there is growing recognition that clients need to be educated to use the powers which they are increasingly being given by the government in the areas of health, housing, the law, and education. The emphasis is on assisting the community to create its own future, rather than having a future thrust upon it by forces over which individuals have no influence.

The increased potential influence which individuals can exercise over their own futures has partly resulted from smaller institutions. In a sense, schools have become one-student institutions: the student has significant control over what is learnt, when it is learnt, the way it is learnt, and the pace at which it is learnt. The same is true for public servants. Those in policy positions now have the equivalent of a statistical section, library, large numbers of clerical assistants, an editorial team (both for graphics and written work), and a

personal assistant at their service. This means that virtually any officer can have great administrative support at a very low cost.

The supportive nature of this environment for both learners and workers came as a shock to many; it was thrust onto a society which was little prepared for it. Most of these changes occured in the decade 1985 - 1995. It has been a period of exponential growth. Governments have been hard-pressed to keep control of developments.

5-22. REDUCED HIERARCHICAL EMPHASIS.

The powerful technologies available have tended to break down the hierarchical approaches to education and public administrtion which have existed for so long. Information is a form of power. Access to information is thus related to power. With manual systems it was much easier to restrict access than it now is with automated systems. As all data analysis is done within computers using standard packages, it is difficult to argue that requested information is difficult to produce. Also, in the late 1980s there was an acute awareness amongst the public about any information to which they were not allowed access. A law has been passed requiring that a red light flash on an individual's terminal when he or she attempts to access information with a higher security classification than he or she possesses. If the person feels that the restriction of access is unreasonable, there are established procedures for appeal. The ease with which participants in the educational and government process can obtain information has broken down hierarchical structures. More and more a person's power is related to his or her ability to

contribute to the goals of the organisation rather than merely to his or her formal position within that organisation.

5-23. MATRIX STRUCTURES IN EDUCATION AND PUBLIC ADMINISTRATION

Related to the reduced emphasis on hierarchical structures has been the all-pervasive nature of matrix approaches to organisation in education and general public administration. These incorporate the advantages of project and functional approaches to organisation, with an emphasis on, respectively, the achievement of specific measureable results facilitating accountablity, and on the maintenance of functional expertise. "The result is that vast numbers of people report to one boss for purely administrative purposes and another (or a succession of others) for practical get-the-work-done purposes." (Toffler, 1981, p. 270).

It has been found that "...computerized conferencing is particularly good for interdisciplinary communications and multidisciplinary projects." (Hiltz and Turoff, 1978, p. 249).

In education, teachers are allocated to functional areas (for example, curriculum development, instructional technology, community development, professional development, or a subject area). Each functional area has a head who is responsible for the development of expertise amongst his or her staff. Staff are allocated to projects as required. Projects are organised on topics as diverse as "The impact on education of the average life span increasing to 100 years" and "The use of holographic technologies in graphic communications". Staff work on project teams for as long as necessary. Each project has a head who is responsible for ensuring that deadlines are met. There is less

emphasis on the traditional teaching function in specific subject area skills (at least in the cognitive domain, as compared with the psychomotor and affective domains); much of this is done more efficiently and effectively by computer.

In public administration there has been increasing emphasis since the mid 1970s on the need for specific results to be achieved. There was also a feeling that there was a need for public administrators to be more willing to shift between areas within the APS. By the mid 1980s increasing emphasis was being placed on the use of matrix approaches in the APS, although, initially, it was found that the complexity associated with large scale adoption of matrix approaches in large systems resulted in much confusion. However, the approach was found to work well in clearly defined sub-sections of organisations - for example, in the development of computer systems within large statutory authorities.

By 1990 these difficulties had been overcome with the assistance of data processing and telecommunications technologies. For example, all projects are now co-ordinated with the assistance of computerised PERT (Program Evaluation and Review Technique) packages. Information on such things as staff preferences for different types of projects, staff qualifications and experience, staff development needs, and project progress, is all integrated into the system.

"Ongoing transcripts of all conferences among middle managers permit monitoring and/or intervention if an unwise decision seems imminent." (Hiltz and Turoff, 1978, p. 144).

5-24. NEW APPROACHES TO PLANNING

There has been great emphasis on integrating matrix approaches to organisation into a corporate planning perspective.

In the early 1980s the Department of Administrative Services developed guidelines for the development of ADP stategic plans for Commonwealth Public Service Departments. These plans incorporated a five-year time horizon.

By the mid 1980s it was increasingly realised that Departments needed corporate plans with broad goals, specific measureable objectives (to facilitate accountablity), and clear strategies designed to achieve the objectives outlined. Strategic plans were then integrated into this plan for each functional area (for example, data processing, personnel, and finance). In 1985 the Public Service Board issued guidelines on the development of corporate plans for Departments and also ran training courses in this area for middle and top management. It was also decided to hold regular six-monthly meetings between all Permanent Heads and Ministers to assist with broadening the vision of Permanent Heads on government goals (and the perspectives of Ministers on the administrative implications of their ideas, the implementation of which would relate to more than one Department).

As it was increasingly seen that there was a need to integrate education with other areas at the State level, it was appreciated that there was an increased need for State Education Departments to also develop corporate plans. A particular emphasis in most of these was on efficient interfacing between Education and other relevant Departments. Education Departments were increasing their roles in such areas as adult training (with a particular emphasis

on retraining, in comparison with initial training), training for participation in societal decision making, and the implementation of a lifelong education philosophy. The complexity of this (in particular in relation to the need to use resources from a number of Departments on many of the less traditional projects) was controlled by using matrix approaches and by having clear goals and objectives to work towards.

5-25. USE OF FUTURES TECHNIQUES

Rational techniques (such as strategic planning approaches) are used to the maximum for efficient and effective policy development. However, it is also recognised that "All these rational techniques are auxiliary to creativity, which is the central way to invent new and better alternatives." (Dror, 1968, p. 179). Futures studies techniques such as scenario development techniques, delphi, CIMAT (Cross Impact Matrix Analsysis on Transparencies), games, role plays, and BOM (Brainstorming on Microfiche) are used to facilitate the development of creative alternatives. It is also increasingly recognised that face-to-face meetings are not necessary for the generation of creative approaches, and may actually inhibit their development.

5-26. "OPENNESS" OF COMPUTER CONFERENCING - ADVANTAGES FOR EVALUATION.

As well as an increased emphasis on the use of futures techniques in the development of programs, there is an expanded emphasis on the need for structured evaluation of the results of programs.

Face-to-face communication is used less than in the past in evaluation exercises because it is much easier to make candid

comments via a computer terminal. Candid comments are essential if educational and more general public administrative organisational improvement consultancy is to work effectively. "Experience confirms the point that the advisory relationship is most effective when decision makers are willing to allow themselves and their operation to be fully examined, and to receive, as well as make, candid disclosure." (Lasswell, 1971, p. 79). This is facilitated at the beginning of the consultancy process by allowing the participants (both consultants and management) to make comments anonymously into terminals.

The openness of computer conferencing has also been found to have indirect advantages in the area of evaluation. "One of the many advantages of an open society is that evaluations of social progress come from a variety of sources." (Jones, 1977, p. 19). Evaluations too often tended to be closed-shop affairs, and were often of a self-justifying nature. With computer conferencing it has been easier to allow for wide participation in the evaluation of educational and public administrative systems. For example, one school council used conferencing to allow parents to input ideas and criticisms at the early stage anonymously. It was found that this increased dramatically the input at this stage. One Commonwealth Department with a large number of service locations allowed clients to input comments when they came for service via the operator. The comments were analysed by a computer package.

CHAPTER 6 - CASE STUDY

This section of the thesis is based on an interview which the author held with Dr Mick March, Principal, Narrabundah College, Canberra on 10 September 1983. Section 6-1 deals with the key themes, and how they apply to the College at present. Section 6-2 deals with the broad question of how relevant the scenario outlined in this thesis is likely to be to Narrabundah College in 1995.

A non-structured interview approach was used in which Dr March was encouraged to comment on his own experience in relation to the key themes and the scenario. The emphasis was on gaining an appreciation of one Principal's views on how the key themes are being implemented in one school system, and also his views on the potential for the scenario to be realised by 1995. In relation to the scenario the emphasis was on gaining one senior educational administrator's perceptions of "probable" futures (as compared with possible [as in the scenario] or preferable futures).

The interview with Dr March lasted for over two hours. This section of the thesis does not consider Dr March's comments exhaustively - instead the author has focused on a number of key areas considered in the discussion.

Dr March has been principal at Narrabundah College since the early 1970s. He has had previous experience as a High School Principal in N.S.W. Narrabundah College is a Government senior college in the A.C.T. schools' system (students being in Years 11 and 12).

My own comments on Dr March's views are included at the end of

each sub-section.

I have also included a section giving an overview of the usefulness and implications of this interview (section 6-3) and have included a number of proposals, flowing from the interview, in the recommendations section.

6-1. THE KEY THEMES

6-1-1. Co-ordination.

Interviewer's comments:

Dr March indicated that being strongly technology-oriented can tend to result in one losing sight of human-relations aspects of administration. There is a possibility of depersonalising information-processing once one gets into the machine age. He indicated that if properly used, however, technological aids are very useful.

He felt that one of the basic problems with data processing technologies is the requirement that data input be extremely accurate. Many teachers feel frightened and "put off" by the precision required. One frequent criticism is that it will be the computer, and not educational requirements, which will determine how the school will be administered. There is a continual need to personalise the information processing. It is important that the people who put the information into the system get it back; that is, that they have a sense of "ownership". A key aspect in the ownership process is to train users.

Dr March also indicated that sometimes it is better to adopt a less efficient model than a totally efficient model, if staff are

willing to support the less efficient model and make it work.

Researcher's reflections:

I agree that efficiency is not the only objective which needs to be aimed for in developing data-processing systems to assist with the co-ordination of educational processes. There is a need for participants to feel some "ownership" of the system (in terms of both its development and refinement). Human relations aspects are also central if co-ordination is to be carried out effectively (for example, teachers need to be "sold" on the need for input data to be extremely accurate if the output is to be useful).

6-1-2. Devolution.

Interviewer's comments:

The A.C.T. government school system is a highly devolved one. Devolution to schools is counterbalanced by the fact that it is a very small system and a very visible operation. Although responsiblity for decision-making rests in the schools, the results of that decision-making are very visible.

In the A.C.T. the Principal is working with a highly educated community. Dr March felt that this internal co-ordinating factor makes for an excellent environment for devolution. He indicated that, for the individual teacher in the A.C.T., there is much more involvement in decision-making than in N.S.W. In the A.C.T. the structures are more fluid, and project teams can be more easily formed.

A difficulty with devolution is that governments are responsible for decisions taken by public bodies. It is virtually impossible

for the Minister of Education to detach herself ultimately from decisions taken in individual schools. Thus, there is a limit to the extent to which devolution can take place.

Dr March indicated that devolution tends to be a representative rather than a full participatory process. This can create a new elite within the structure. Representatives tend to be better educated people, who are already involved in the system at some level. "John Citizen" will not necessarily either stand for election or get elected. However, to make participation less elite would involve the administrator attending even more meetings than at present.

Another difficulty is that the more people become involved in the decision-making process, the less weight the views of any one participant on average will have. The more educational administrators try to involve people, the less power any single individual has. This results in a feeling of powerlessness for people who are participating. There is, however, a non-zero sum of power. One can share power, build it up, and form coalitions.

Dr March indicated that most people experience frustrations at times because of the slowness of the A.C.T. educational decision-making structure. For example, even the A.C.T. Schools Authority cannot make decisions which will "stick". They attempted to close Watson High School and failed - as a result of community pressure. The school is now temporarily closed because of the "asbestos scare" - again because of union and community pressure.

Researcher's reflection:

It is clear from Dr March's comments that there is a degree of

conflict between devolution and Ministerial accountability (as I have considered in Section 1-2 of this thesis). Also, it is interesting to consider how the educational level of communities could affect devolution. If devolution is to be carried out effectively, it is essential that both well-educated and less well-educated parents be able to participate. The key difference between these groups of parents would be that one group would need little facilitation to participate in a devolved structure and the other would need facilitation. Clearly there is a need for an advocacy role in relation to participation by the poorly educated. It is also important to consider ways of facilitating new approaches to participatory-based involvement (compared with representative involvement). For example, it might be appropriate to consider such approaches as "Search" conferences which can involve large numbers of people considering policy options. "Search" approaches can be compared with traditional approaches to considering technological change, which only involve elite decision-makers.

6-1-3. Participation.

Interviewer's comments:

Parents, teachers, students, and other citizens can participate in School Boards (school governing bodies) in the A.C.T.

Dr March indicated that the majority of non-teacher or non-student members of School Boards tend to be either parents of students, or ex-students. It is rare for a Board to ever have its full quota of community representatives nominate for positions. For example, at Narrabundah College elections for School Boards are held only occasionally.

Dr March indicated that teachers can participate through school boards, faculty meetings, executive planning meetings and so on. The extent to which this results in real participation varies from school to school. To some people a staff meeting is a meeting where the Principal tells the staff what they will do. Other schools have staff meetings which allow all staff members to contribute.

Participation by teachers also occurs in the promotion process. Dr March felt that this is important if teachers are to be "professionals" in the true sense of the word. The ideal of peer involvement in the measurement of professionalism is a key feature of this concept. However, there are difficulties. It is hard for a teacher's peers to tell him or her that he or she should not be considered eligible for promotion (even after perhaps twenty years of teaching).

Dr March indicated that most secondary schools have student councils. However, Narrabundah College has experienced various lengthy periods when, because of a lack of student support, there was no student council. A council has recently been re-established.

Generally, popular students are elected to the School Board. There is a danger that the students on the School Board will eventually come to be seen as part of the establishment. There needs to be a mechanism for student representatives on School Boards to report back to fellow students. Without a student council this is difficult; however, newsletters can assist.

Researcher's reflections:

These comments show that a key feature of professionalism is the determination of standards by the professionals themselves. Certainly in relation to teacher promotions it is clear that there is a heavy emphasis on professionalism in the A.C.T. However, it could be argued that the extensive involvement of other groups (such as parents, students, and other community groups) in educational decision-making limits the professional autonomy of teachers. This is an increasingly common feature of all professions (for example, there is increasing emphasis on disadvantaged groups having more control over medical processes, and government control over accounting standards).

It is also clear from Dr March's comments that it is much more difficult to establish a participatory, compared with a representative, model for community participation in school governance.

6-1-4. Decentralisation.

Interviewer's comments:

Dr March stated that there has always been a limit to freedom, and that there always will be.

In relation to the A.C.T. schools system this means that only well thought-out decisions can "survive". There are so many checks and balances that a radical decision will need to be very good to be accepted. Regrettably, some quite good decisions never get off the ground because of the excessive difficulty in decision-making.

Dr March felt that there is a general conservatism of both parents and students in a time of economic recession. This makes change more difficult, even though it is possible under the formal rules. Students are particularly conservative; they are less adventurous than they were in the middle 1970s. Some students seem to see education as a race to gain marks. They worry about employment and the competitive nature of entry to tertiary studies. In 1975, when Narrabundah College surveyed students about the subjects they wanted to study, there was a great diversity of subjects requested (in such things as life skills), but few students ever actually took these subjects when they were eventually offered as part of the curriculum.

Conservatism in curriculum choice also results from external pressures. Dr March indicted that the subjects which are accepted as part of a tertiary package are becoming more rigourously scrutinised. The Australian National University is exerting more pressure on the content of subjects for tertiary entrance and has complete freedom in either accepting or rejecting College syllabi.

In 1982 the Economics faculty at A.N.U. had a very poor pass rate in first year courses. They responded by blaming the Colleges, and by laying down strict criteria on the content of College Economics courses (if they are to count for A.N.U. admissions purposes), even though there is no close relationship between studying Economics at College and at University.

Researcher's reflections:

It is clear from Dr March's comments that there are a number of limits to the impact of a decentralised structure on a particular

College. These factors include the review procedures through which all decisions need to pass, the conservative nature of students and parents (particularly in times of economic constraint), and external factors (such as tertiary institutions). It could also be argued that a structure which only allows for "good" (that is universally accepted) decisions to survive will tend to be one which is not able to respond quickly to social changes, or to give encouragement to innovators.

6-1-5. Consultation.

Interviewer's comments:

Dr March indicated that if a Principal is to involve himself in radical change, he will generally have meetings with staff, parents, and students. At present Narrabundah College is examining its aims and objectives. It has brought in consultants to structure such meetings. The consultation process in this case has not extended to the whole community.

Narrabundah College recently organised a day for students to consider the aims and objectives of the school. Attendance was not compulsory, and only twenty students attended.

Researcher's reflections:

It is clear that consultation is particularly important if a Principal wishes to introduce changes. However, the offer of consultation will not always result in participation (particularly when more attractive alternative uses of time are available). This is highlighted by the lack of student interest

until recently in having a Student Council (as outlined in Section 6-1-3).

Technology and computer-based procedures may facilitate consultation and participation, in that they can allow for student input at times convenient to them, and in ways which are non-threatening. Interpersonal interaction must be retained as being of primary importance; the technology should be seen as a supplement to other approaches to consultation, not as a replacement for them.

6-1-6. Networks.

Interviewer's comments:

Dr March outlined various types of education networks in the A.C.T. which influence Narrabundah College.

There is a local education network. This involves the High Schools and Primary Schools in a College's immediate region. The problem is that the student population of most Colleges comes from across the A.C.T. (and also from other States and even overseas).

Regional meetings of School Boards are held occasionally so that if a primary school is planning a new curriculum innovation (for example, the introduction of a new language course) it can liaise with other schools (for example, secondary schools) which might be interested in developing a co-ordinated approach between different levels of education in the region.

The College is involved in a network of international schools through the International Baccalaureat Program (this is a year 12

program acceptable for tertiary entrance purposes in a number of countries). The College also has close linkswith Senior Colleges in Tasmania.

Principals nationally have close linkages; for example, a High School Principals' conference was held recently in Canberra, and the National Conference of Principals of Independent Schools was held in Brisbane early in 1983.

Teachers tend to network through professional Teachers' Assocations (for example, in Mathematics) which are organised locally, and are part of national bodies.

Many educational administrators in the A.C.T. are involved in the Australian Council of Educational Administrators. Senior educational professionals often are members of the Australian College of Education.

At the Year 12 level the A.C.T. Schools Authority is linked with a number of examining bodies. The Australian Conference of Examining Bodies meets two times a year. Representatives from the agencies are involved in the meetings, and there is generally a teacher representative from each agency (usually a College Principal in the case of the A.C.T.).

Dr March felt that there is not as much networking as there ought to be. For example, it is rare for all the staff development funds to ever be completely expended in the A.C.T. Also, sometimes it is very difficult to get staff to investigate educational projects elsewhere in Australia.

Researcher's reflections:

It is clear from the above comments that there are extensive networks of all aspects of education in the A.C.T. These networks are organised along both functional (for example, subject area) and project (for example, the International Baccalaureat Program) lines. However, it could also be argued that information on networking opportunities is not as widely available as it should be, given the fact that all the money available for staff development purposes is rarely expended.

Further, the increasing costs associated with actual attendance at National conferences, or with national data collection for research, are becoming prohibitive for many potential delegates and researchers. It is clear that the new computer-based technologies will have the potential to permit greater national involvement without actual attendance, and in these ways, educators of all types should be significantly assisted with this type of networking.

6-2. SCENARIO

This section of the discussion focused on Narrabundah College and the relevance of certain aspects of the scenario to possible futures for Narrabundah College up to 1995.

6-2-1. Computer packages.

Interviewer's comments:

Dr March argued that many people deplore the fact that, partly because of the influence of the modern calculator, some students cannot perform routine mathematical processes such as the long-

division algorithm. He indicated that the advantage of the calculator, if properly used, is that examples of real-life mathematics can be looked at without the arithmetic obscuring the logic of the problems. Once one gets to the stage of being able to program as well, the ability to explore ideas, structures, and logic by numerical analysis is extended tremendously. This can be done without being detrimental (according to many people) to the individual's ability to calculate. However, some balance must be drawn between understanding concepts and technical skills.

Mathematicians have been the first to use computers. This is not surprising, taking into account the logical processes involved. However, computers are now spreading into other subject areas. For example, at Narrabundah College a computer has been installed to teach students word processing techniques. It is essential that typists learn these techniques, for it will not be long before all businesses have simple word processors. The science department at the College has requested that mini computers be made available for use in physics courses. The design technology teachers are investigating computer graphics package usage. These can be used in the technical drawing component of courses. They can assist with giving students a clearer understanding of perspective, and general design principals. A synthesiser is used in the music department - this is based on microchip technology.

In the College students are free to choose the subjects they wish to study. Thus, there is no way that typing can be made part of a "core curriculum". There are no compulsory subjects at all. Nevertheless, Dr March indicated that in future there will need to be an increased emphasis on keyboard skills. Students will also tend to learn to type at home using home computers.

He feels that packages will be used extensively by 1990 and almost universally in Australian education by 1995.

Packages will also be used in educational administration. Narrabundah College has been using computer systems since the early 1970s. Many reports are generated. However, this is not necessarily a good thing, because the reports produced do not necessarily focus on the information need of the educational administrator. The current administration computer system at Narrabundah College is batch-based rather than real-time via terminals. In such an environment it is possible to print-out the academic status of every student but not to have a terminal in the principal's office which he could use to gain customised reports quickly.

Dr March believed that by 1995 senior teachers and educational administrators would have terminals on their desks, and would obtain reports via "user-friendly" query languages.

Researcher's reflections:

I agree that real-time systems will enable educational administrators to access information in a more focused fashion. However, such systems will only be used efficiently if administrators are trained to use the systems to gain the information they require. With interactive query-based languages becoming generally available (designed to allow information systems users to request customised reports using English language-like commands), this training should emphasise report design rather than computer programming. As is clear from the scenario in this thesis, I also agree with Dr March's vision of

the extensive use of computer packages in all subject areas and their expanded use in the home. For example, extremely effective economical interactive packages are already available to teach skills such as typing.

6-2-2. The role of school and public libraries.

Interviewer's comments:

Dr March argued that broadening the role of libraries and allowing students to learn from home would produce individualised learning and a lack of control and standardisation. He felt that this would worry many educators. From a cynical point of view, it could be argued that many educators and community members would not care what people know, as long as everyone knew the same thing. It is the fact that different people know different things that causes concern.

He felt that the use of mastery learning packages is not related to the way people learn. They tend to create boredom and force people to go through learning steps unnecessarily. They do not take account of the enormous capacity of the human mind. This learning facility needs to be built into packages. Dr March doubted that the problems with mastery learning packages will be solved by 1995. The combined effect of many people "out to make a quick quid" and many teachers being lazy in their teaching and software-selection process means that much software will be of a very poor quality. Schools will need to have a rigourous ADP strategic plan, and all proposed software purchases will need to be thoroughly tested.

Dr March felt that the actual role of the teacher as an

intervener in the learning process would have to be developed if students were to learn from home. Teachers would need to have a considerable amount of training to play this new role, and teachers at present have not always had the necessary training. However, once this sort of learning becomes more common, teachers will want to learn about it. Conservative forces will need to be overcome. People will need to be conditioned to think of this learning as acceptable.

One approach to this would be to have pilot programs. The "School without Walls" (an innovative Government school in Canberra which emphasises the use of community resources) could be such a pilot. This school was designed to use community resources, with students spending much of their time outside the school building learning in the community (using such organisations as the National Library as learning resources). In the pilot program, students would learn on their own at home with the aid of computer terminals much of the time, and the school would act purely as a co-ordinating body.

As regards a more conventional community education approach mentioned in the scenario, Dr March indicated that most schools in the A.C.T. do not have community libraries (libraries available outside school hours). He felt that it could be a very effective use of a school resource, and would be a positive goal to work towards.

Researcher's reflections:

As regards the last point mentioned above, I feel that the cost of allowing for the duplication of such resources as libraries

will ensure that school and community libraries are combined or closely coordinated, and accessible to all.

Dr March's comments on mastery learning software are based on approaches to computer assisted instruction which are out of date, but which are regrettably still reflected in some commercially available software. Good mastery learning software now has a testing component which allows students to "jump" modules of a learning program which they already understand to a predefined level of competence. The software can also be designed to allow for customisation to the learning style which best suits the individual learner (for example, strongly graphically or prose-oriented, depending on the student's success in learning earlier material based on alternative presentation approaches). As with all types of packages, it is essential that the software be tested before purchase, and fit in with an overall ADP plan for the school. However, this does not mean that computerised mastery learning approaches as such are inappropriate as Dr March's comments would seem to suggest.

Both pre-service and in-service training of teachers will need to reflect rapid changes in technology and their applications in education. If this is not done, teachers will not cope, and by default, will become increasingly redundant.

6-2-3. Innovative approaches to education.

Interviewer's comments:

On the issue of parents playing a key role in the education of the young, Dr March indicated that schools were established to meet a particular need in society. Certain skills were needed to

survive in the late nineteenth century, which the average parent did not have. Consequently it was necessary to provide "elders" (teachers) to children in an isolated environment (the school). Dr March wondered whether in the future parents would have the skills needed to impart knowledge. Even if parents were to play a role, Dr March felt that teacher the would still be essential for isolating and packaging information in an accessible way. He felt that teachers will need less specialised knowledge, and more skills in facilitating learning and accessing information.

Dr March did not feel that the full vision of the scenario will have been achieved by 1995. He cited as evidence for this his view that in the last decade in the A.C.T., changes have not been as dramatic as envisaged in the scenario. Instead, the progress which has occured has tended to be of "a few steps forward and a few steps back" nature. However, he did feel that there will be a growing call for data base and networking access. There will be less emphasis on textbook learning and more on using data bases and networks generally (if these are readily available). He felt that people may have some difficulty in adjusting to involvement in extensive international liaison via networks.

Dr March indicated that lifelong learning could be very costly if current approaches are used. However, the use of new technologies may make it cheaper to allow for this type of education.

Researcher's reflections:

I feel that there is real potential for parents to play a key role in the education of the young. Where they do not have the basic necessary skills, it is the responsibility of the education system to provide programs to assist them in gaining these

skills. It is regrettable that with Australia's low participation rates in education (for persons over fifteen years of age) many parents (unless there are significant changes) will continue to lack the higher level conceptual skills necessary for them to assist the young in learning. This does not change the desirability of the vision - it means that more resources must be put into assisting adults learn the necessary skills.

The rate of change in the last decade in the A.C.T. may have been relatively slow; however, inexpensive and powerful communications and computing technologies were not available at that time. The development of inexpensive computer networks and related technologies needs to be recognised as being potentially as significant as the development of the printing press for learning. If these technologies are not applied quickly, human potential will be wasted. This must be seen as the crime which it is, rather than as "a continuation of past trends". Adult education will also need to increase people's awareness of the potential uses of the new technologies, if significant numbers of community members are to become involved in such things as international networks.

6-2-4. Approaches to career education.

Interviewer's comments:

Dr March posed the question of whether we will be talking much about careers in 1995. Unemployment could be as high as 30 or 40%. He felt that people will have to be educated to foresake the ideal of having a conventional career, and that there would be a need to break down the rewards associated with having careers.

He felt that mentors (which were considered in section 5-5 of the scenario) could be paid to assist other people in learning broad skills (not purely as a career education device as envisaged in the scenario).

In relation to the "Adopt-a-School" concept, he indicated that businesses do not adopt local schools in Canberra, although some businesses offer prizes for school competitions. Work experience goes some of the way towards this concept.

Researcher's reflections:

I agree that unemployment will continue to rise, and that there is a need to broaden one's vision in relation to career education. I would agree that mentors could be used to assist young people in gaining an appreciation of such diverse activities as how to participate in handicrafts or in social change processes. I do not agree with Dr March's view that the rewards associated with having a conventional career need to be broken down. What is needed instead is for much of the potential satisfaction from having a career (such as the feeling of contributing, and being able to have a reasonable standard of living) to be offered to the unemployed, through involvement in non-career based activities.

6-2-5. Communicative competence.

Interviewer's comments:

Dr March felt that a broader concept of communicative competence is an ideal goal. However, this assumes a basic level of intellectual competence. For some people this level may be too

high, and may be undesirable even if it could be attained. From a cynical point of view, it may be better to keep people ignorant. The only people who start revolutions are those who know they are badly off.

He indicated that a significant part of schooling (he prefered not to use the word "education" in this context) is for strong socialising. Fundamental survival skills are taught with an emphasis on the need to obey rules (in relation to such things as physical violence). He wondered if such socialisation could occur if students learnt from home. He indicated that schools keep children together and form them into a society. If they learn at home they may become more individualistic (even if well taught) and interpersonal skills may suffer.

By 1995 people will be using the new technologies but, if they are too mechanically complex, some people will feel discouraged from using them. It is therefore essential that the equipment be "user-friendly", simple, and developmental. There must be a structure which will assist people to learn broader communicative skills, but which will also allow them to proceed at their own pace. It will take at least 12 years to achieve this.

Researcher's reflections:

I would agree with Dr March that it is important for children to learn basic social values. This can be achieved through them being at school with other young people some of the time. Also, students who behave in deviant fashions could be required to attend schools in a way similar to that in which deviant young people at present are required to attend remand centres. However, I do not feel it should be necessary for all young people to

attend school 100% of the time in order to learn how to behave in society. In fact, it could be argued that more deviants are created by schools than are reformed by them (in that schools give disadvantaged children a feeling of inadequacy and failure which may result in them seeking rewards in socially undesirable ways). I would also argue that Australian society needs more creative individuals if it is to remain internationally competitive in a global economy increasingly based on the creation, storage, and communication of knowledge rather than on the production of goods and services in tightly defined hierarchical organisations. If this is the case education should encourage, rather than stifle, individualism.

6-2-6. National educational data base.

Interviewer's comments:

Dr March agreed with Bennett that there is conflict between freedom of information and privacy ([1988, p. 3] as outlined in section 4-3-3 of this thesis).

He felt that it is desirable for people to have strong information-accessing rights. However, it is also critical that bad information not "follow people" forever. People should be able to "shrug-off" a negative label, and not be permanently classified as deviants. Data needs to be edited regularly, so that people know what information is held about them (they would be given copies of their records as a part of this process), and records relating to childrens' court offences should not be held for long periods.

Researcher's reflections:

I feel that Dr March's specific proposals in regards to privacy protection could play an important part in ensuring that a degree of privacy is maintained in a "Network Nation". The concept of keeping only negative information on persons for a specified time would be worthy of further exploration, but it should not apply to more major crimes.

6-2-7. Distance education.

Interviewer's comments:

Dr March agreed that a national educational data base on itinerant students would, if established, prove very helpful, but felt the logistics could be overwhelming.

He predicted that satellites will have as big an impact as the pedal-radio did for education in isolated areas. Such technologies will also assist with teachers' conferences. National conferences are becoming very difficult to arrange at present, partly because of the increasing cost of travel. At the same time, the desire for national conferences is growing. Dr March felt that educators need to look for new ways of exchanging information. It may not be as enjoyable to sit in front of a terminal to participate in an international conference as to attend a conference in person (for example, in Miami); however, many international conferences could be organised more efficiently on a regional basis with interchange of information via computer networks between regions.

Researcher's reflections:

I agree with Dr March that there is real potential for new technologies to be used in facilitating the interchange of information between educators as a supplement to other approaches. It would be appropriate for the Australian College of Education to approach the Overseas Telecommunications Authority to fund a pilot linkage of regional conferences between professional educational assocations in different parts of the world.

6-2-8. Adult education.

Interviewer's comments:

Dr March doubted that continuing education would be required of large numbers of professionals in order to maintain their status by 1995. However, he did indicate that the Teachers Federation in the A.C.T. has accepted involvement in continuing education as a criteria for promotion. Compulsory attendance at courses to maintain status industrially is not, however, required.

He indicated that compulsory continuing education may be more likely to come in the para-professional areas. For example, doctors may apply pressure to require continuing education for nurses, rather than for themselves. The people at the "top of the tree" generally see themselves as fairly competent and not requiring continuing upgrading, but they see a need for this for "the minions". Dr March felt that, similarly, the Principal of the school is more likely to require continuing professional development of his staff rather than for himself. Yet intuitively it may be that the administrators are the ones who are most in

need of continuing education, and are possibly the ones least likely to receive it.

Researcher's reflections:

I would agree with Dr March that it is likely that para-professionals will have pressure put upon them to accept compulsory continuing education (if only to up-grade their status). However, I also feel that professionals will feel increasing pressures to define compulsory continuing education requirements for themselves, as the public becomes less deferential towards them. If professions do not define these requirements for themselves it is likely that governments will do it for them. The need for continuing professional development is likely to grow exponentially, as will technological change.

6-2-9. Leisure.

Interviewer's comments:

Dr March felt that there is a need to break down the distinction between work and leisure in peoples' conceptual frameworks. By 1995 we may need to think about all human activity not necessarily being categorised in as value-laden a way as at present. For example, some people currently talk about leisure as being less valuable than work.

Researcher's reflections:

I would agree with Dr March that there is a need to break down distinctions between work and leisure. I feel that technologies such as computer networking could facilitate this by allowing people to work from home, to search for information in their

leisure time, and to work in team situations. One would hope that such approaches would tend to make work less alienating, and allow for the incorporation of some of the positive aspects of work in leisure activities. Also, such technologies could assist with the development of new leisure pursuits which are more socially developmental than the often non-participatory sporting activities which many Australians currently watch on television most weekends, and increasingly during the week as well.

Governments will increasingly be called upon to provide and financially support such gainful social activity.

We need to redefine work and leisure and ensure that people are gainfully engaged in some activity for the 30 hour working week. These activities may not be "work" according to our present conceptions of employment. It is clear that many future employment opportunities will often be in the information and human development areas, and educators must be trained to convey this to students and the entire community. Notions of unemployment must be re-conceived to refer to those who are not gainfully engaged in productive activity.

6-2-10. School buildings.

Interviewer's comments:

Dr March believed that school buildings will still exist in 1995. They will be used partly as central agencies for organising educational experiences. He found it difficult to see how practical subjects such as science, art, and physical education could be taught efficiently at home. Art may become more terminal-oriented; but computers cannot produce quality paintings

as conventionally interpreted. Also, learning practical skills like motor maintenence (psycho-motor skills) requires hands-on experience with a teacher observing. It is too costly for everyone to have his own backyard laboratory.

He commented that it is interesting to note that the subjects which many peope see at present as the "raison d'etre" of the educational process could be taught at home for a large percentage of the time (for example, mathematics and English).

Researcher's reflections:

I agree with Dr March that the role of schools will change, and that many psycho-motor skills will still need to be taught in a group environment in 1995. However, this does not affect the viability of the broad thrust of my scenario, which does not propose that students learn at home 100% of the time. Also, Dr March does not appear to appreciate the potential for students to develop "masterpieces" on terminals with sophisticated graphics/artistic packages. Computer systems can simulate such things as chemistry experiments, and motor maintenance activities, often saving money and not exposing students to dangers from explosions (effectively this could allow every student to have a "backyard laboratory"). My own view is that students will learn aspects of all subjects at home, and other aspects at school.

I would agree that the school will continue to play a role in 1995, but that it will be significantly changed, and very likely specialise in particular activities. It is virtually certain that the school will generally be an all-age community education centre, rather than restricted to children and young people as is

often the case at present. There will be a particular emphasis on the school providing a venue for socialisation.

6-2-11. Terminal addiction.

Interviewer's comments:

Dr March indicated that already some students are "hooked" on computer terminals. These are usually not the best students; rather, students who are less successful in a conventional learning environment seem to gain some measure of success and satisfaction in being able to use computer systems.

Researcher's reflections:

I would comment that it is regrettable that schools have not been designed so that "average" students can receive from normal education the sort of feedback and re-inforcement they gain from computers. There is a need for educators to recognise that the features which computers offer (such as immediate feedback of results and the ability to study at one's own pace) are essential if average students are to find educational experiences as positive as possible.

6-2-12. International task forces.

Interviewer's comments:

Dr March was unsure whether young people could be involved in international task forces. As an ideal he felt that it would be a positive thing; however, he indicated that there is a limit to educators' imagination. Where values are concerned, most people are innately conservative. For example, some educators would

reject the use of international task forces as a learning mode because it is not possible to test international task force participation. Skills and knowledge which can be more easily tested tend to be taught.

Researcher's reflections:

I would agree with Dr March on this last point. However, this does not make it any less important for educational programs to be broadened to include such things as international task force participation by young people. Educators with an interest in the use of such techniques could start working now on new approaches to evaluating such activities, so that they can be introduced more easily into conventional school programs.

As educators, we should be more careful that we do not shy-away from difficult decisions. If educators are to have an influence in the curriculum content of the future, then issues such as the one above must be confronted and pursued.

6-2-13. Multi-purpose social institutions.

Interviewer's comments:

Dr March indicated that we tend to be a very specialised society.

He felt that the development of multi-purpose institutions would be one approach to overcoming this. Another would be to have greater interchange between institutions. Dr March was unsure which approach he favoured, but felt that the motivation of the individuals involved could be a problem in implementing such approaches (for example, in the context of a Youth Remand Centre).

Researcher's reflections:

My own feeling is that there needs to be more interchange between institutions (in the short term) but that institutions should also aim to be more fluid and multi-purpose in the longer term.

Economic and technological costs will prohibit all institutions from providing all services. However, it will become an economic and social necessity for institutions to be flexible whilst developing strong networks with other institutions, and to be specialised in certain areas. Society is pluralistic, and practice would tend to indicate the multi-purpose pluralistic institutions are the more stable politically.

6-2-14. Matrix structures.

Interviewer's comments:

Dr March felt that expertise will become more important than position in hierarchies. He felt the thesis that devolution will mean less emphasis being placed on formal position power, was a supportable one, since more information would be distributed. However, he also indicated that many people gain their rewards from their personal position and status, and that it is part of a basic human tendency to evaluate people using a hierarchical approach.

Researcher's reflections:

I would agree that position power will become less important in a devolved computerised structure. However, I disagree that it is part of basic human nature to evaluate people according to their position in a hierarchy. In Western cultures this is certainly

part of current business cultures; however, person-centred value systems are gradually becoming more generally held. These will become more pervasive as there is less need to motivate people to aspire to senior formal positions in tightly structured hierarchical organisations, which diminish much of a person's individuality in return for a high income and social esteem.

6-2-15. New approaches to planning.

Interviewer's comments:

Dr March indicated that planning approaches are being continually developed in education. People are becoming more experienced with them in the A.C.T. Schools Authority (for example, in relation to assisting schools update their aims and objectives). He felt that new technologies could facilitate more efficient consultation with the community in relation to these processes (assuming citizens are receptive to being involved).

Researcher's reflections:

I agree with Dr March that planning approaches are continually being developed, and that new technologies could facilitate more broad-based consultation with wider community groups in educational planning.

The concepts of co-ordination, devolution, participation, consultation, and networking are inter-related and will each have a significant role in the planning approaches to be used to best accommodate and gain from the new technologies.

6-3. CONCLUSIONS

I found my discussion with Dr. March very useful in terms of considering both the relevance of the key themes to an educational administrator's experience in a particular education system, and also how the scenario might be implemented in a particular school.

In relation to the implementation of the scenario Dr. March made me particularly aware of the following:

* The need for in-service education for both teachers and educational administrators if new technologies are to be used effectively. This in-service should include components dealing with the use of mastery learning computer packages, the use of computers in non-traditional subject areas, and the use of real-time computer systems in educational administration (as compared with batch-based systems).

* The need for schools to be careful in their selection of computer software. I would argue that all schools should have an overall ADP strategic plan (as do Commonwealth Departments) and that software should only be purchased if it can be shown to fit within this plan, and has been properly tendered for and fully tested.

* The need for research to be undertaken into what senior educational policy makers perceive as the goals of education. If it is desired that a significant proportion of young people should remain relatively ignorant and come away from school with a feeling of powerlessness, then it would be most inappropriate for many of the technologies considered in this thesis to be used

in education. My own feeling is that such an appreciation of the purpose of education would be held by virtually no present day education policy-makers (although it could be argued that this is the result of current approaches to education in many cases, even if it is not the intended purpose).

* There needs to be further research undertaken into how parents could assist with the education of their own children. In particular, it needs to be determined whether more educational resources should be directed to new approaches to adult education so that parents can gain the necessary conceptual and teaching skills that will assist them in participating in the education of their children.

* More research needs to be undertaken into approaches to participative consultative processes in education (as compared with representative approaches), which do not require senior educational administrators (in this case Principals) to give unreasonably of their time and effort.

* Further research needs to be undertaken into the question of what skills will be needed in order for people to be defined as "communicatively competent" in the twenty-first century. Particular consideration needs to be given to new types of information acquisition, processing, and dissemination, skills.

* Consideration needs to be given to the question of how core social values can be taught to young people using computer networks as an aid.

* Research needs to be undertaken into how regional conferences based on the use of communications networks could be made more

attractive for participants (as compared with, for example, attending an international conference in person).

* It would be useful to know why students can become "terminal addicts" but very rarely become "addicts" to learning in conventional learning environments.

* Consideration will need to be given to how educational administrators who gain their satisfaction from their position and status could be kept satisfied in an organisation which values expertise rather than formal authority.

More generally, Dr. March has made me aware of how detached one can become, when dealing with possible futures, from the actual every-day considerations faced by senior educational administrators.

There is real value for persons attempting to develop possible and preferable futures to have regular discussions with pragmatic senior administrators working in the system they are studying. This will not necessarily change the researcher's vision. What it will do is make him or her aware of issues which need to be faced if the vision is to be "sold" to senior practitioners in the field of interest.

7. CONCLUSIONS.

Specific conclusions relating to Chapter 6 of this thesis are included in sub-section 6-3.

In this thesis I have considered how a number of key themes are currently interacting in public administration and education (in chapter 4) and how they could affect them in the future (in chapter 5). This is followed by a case study which includes consideration of the limitations to the effective implementation of the key themes, as seen by one educational administrator, currently working in the A.C.T. school's system, together with his views on the positive and negative features which he saw in the scenario. The case study was particularly useful in highlighting one senior educational administrator's view of a probable future for education in the A.C.T. in relation to technological change.

In general terms, my key conclusion, based on the evidence I have analysed in this thesis, is that computer conferencing, data processing, and other new technologies (including new approaches to organisational design) have great potential to assist with the restructuring of educational and general public administrative systems in the 1980s and 90s.

They could be used to:-

* Make educational opportunities more universally available throughout people's lifetimes. This is an essential attribute of an educational system which is designed to assist people in coping with a rapid rate of change. It is also essential if the economy is to respond rapidly to changes in demand for goods and

services (both domestically and internationally).

* Increase flexibility of working arrangements. This will have real potential to assist previously disadvantaged groups to be involved in the workforce (for example, married women with young children). It will also allow people to have greater choices in their lifestyles.

* Allow for increased involvement of persons in societal governance. This is particularly important if democratic decision-making is to result in decisions which are based on correct information.

* Improve evaluative procedures both in education and general public administration. In a society which is increasingly questioning the effectiveness and efficiency of governmental programs, it is essential that all techniques (particularly relatively low-cost techniques) which could assist with the focusing of resources in areas where they will have the most impact be used.

* Reduce the gap which currently exists between work and education. In a society in which there is a need for regular retraining, it is important that this gap be diminished.

* Reduce the current gap between work and leisure. This would partly result from the increased flexibility which workers would have in determining their work patterns. It would also partly result from the multiple uses to which such technologies as computer terminals and networks could be put (for example, they could be used for both personal and business communications).

* Provide massive support of an information accessing, processing, and presentation type to both workers and students. This information will be able to be provided much more inexpensively and efficiently than at present. Also, the emphasis will be on assisting both workers and students focusing-in on the exact type of information they need (with the aid of technology) to avoid information overload (that is, there will be an emphasis on exception reporting in business and tight problem-definition in education).

* Improve understanding between nations, and reduce the need to travel in order to communicate with people of different cultures. This would both reduce the use of non-renewable resources, and reduce the potential for warfare resulting from misunderstandings between persons from different cultures (in the longer term).

* Facilitate new approaches to governance, with more types of linkages between citizens and their representatives in Parliament. This is particularly useful when one considers the very limited time which parliamentarians have in which to meet personally with their constituents.

Some dangers which need to be considered <u>before</u> these technologies are introduced on a wide scale include:-

* That "...the technology is more portable than people often realize and those countries that offer the best [in this context meaning the least controlled] regulatory environment could easily become world information centers." (Hiltz and Turoff, 1978, p. 459).

* The need to involve citizens and unions in planning for their

introduction. The non-involvment of unions in technological change has resulted in industrial disputation. It has also resulted in the inefficient selection and use of the technology in question. It is essential that workers be able to have an input into the selection of new technologies, since they often have a different perspective from management on the "non-formalised" aspects of the system with which they work.

* The need to ensure that privacy is maintained. It is particularly important to ensure that international data enclaves are not allowed to develop which could process Australian data without the need for the protections which Australian law specifies.

* In relation to privacy "...it would cost little to intercept, screen, and automatically analyze all the computer-stored communications that a person sends [via a computer conferencing system]." (Hiltz and Turoff, 1978, p. 488).

* The need to avoid burn-out and other occupational health problems resulting from the over-stimulation which such systems can provide. This is particularly important when one takes into account the high rate of burn-out which already occurs with executives using manual systems and the almost addictive nature of many computer games.

* The need to ensure that, where such systems are used for evaluation (of either students or workers), the emphasis is on providing ways of improving rather than on purely negative evaluation. The dangers in using the equipment purely to control operators is reflected in the sophisticated monitoring packages which are already in use for computer input personnel: these will

no doubt become more sophisticated in future (and include components which will allow them to do higher level evaluative work).

* That such systems do not restrict social intercourse of other kinds. This danger is not as great as it might first appear, particularly when one takes into account the reduced need for travel which these systems could facilitate (the time saved in travel could be used for socialising).

The major limitations are not with the technologies themselves - they are with the flexibility which is allowed policy developers in education and general public administration. Until organisation structures are redesigned to allow for greater responsiveness, it will be difficult for such systems to respond to the challenges posed by these new technologies.

8. RECOMMENDATIONS

8-1. GENERAL PUBLIC ADMINISTRATION

* It is obvious that as a result of technological and social change the APS needs a systems-disturbing component (this may be sections or individuals within the APS). As Corbett has indicated, "Public services need to be creative as change-agents, or at least some parts of them need to have that sort of capacity, the capacity to respond to, and even generate system-modifying ideas and policy proposals; for if such capacities exist nowhere in the public service our political social and economic systems may well suffer the fate of the dinosaur." (1978, p. 68).

* In view of the fact that "Creativity and invention may...be influenced within policymaking organizations by institutionally protecting innovative thinkers from organizational conformity pressures"(Dror, 1971, p. 19), I would recommend that the PSB investigate ways in which such innovative thinkers could be identified and protected from conformity pressures.

* That the Commonwealth Public Service Board establish a unit similar to the Congressional Clearinghouse on the Future (but on a much smaller scale) with a responsibility to keep the Commonwealth bureacracy up to date on possible long term futures. This Clearinghouse would also have an educative function for public servants, and a consultative role in such activities as liaison with unions on technological change, and in considering Commonwealth usage of new technologies (such as Videotex) in the early planning stages.

* That the Australian Institute of Public Administration, together with Telecom, investigate innovative approaches for the use of telecommunications technologies in general public administration and report the results of these studies in the the journal of the Institute. Particular emphasis could be given to such questions as:

* how telecommunications could be used to improve client servicing and involvement in planning;

* how computer conferencing could facilitate the development of innovative organisational structures in the public sector; and

* how telecommunications technologies (in particular Videotex) could be used to communicate information to the public on public sector programs of relevance to the general community. The issue of who should fund the allocation of space for community-type information in such systems could also be investigated.

8-2. EDUCATION

It is recommended that in relation to education:

* The Australian College of Education, together with Telecom, experiment with the use of such technologies as computer conferencing, videotex, loud-speaking telephones, and confravision, in various instructional and educational administrative contexts - and report the results in Unicorn.

* That educators with an interest in the use of such learning approaches as international task forces of young persons begin working on student evaluation techniques for these innovative approaches in order to facilitate their more ready acceptance into conventional educational environments (whereas Dr March

points out in his comments on the scenario [in section 6-2-11], those things which can most easily be tested (and to be taught).

* That the Australian College of Education liase with the Overseas Telecommunications Commission in an attempt to develop a pilot network of regional educational conferences ("Technology and Education" would be an ideal theme for such a pilot).

* A number of educators co-operate in the development of schools to act as "beacons" in each State in the area of technology and education. A particular emphasis might be on the need for both community participation in the school, and the use of new technologies for social development.

I agree with Dr March that the "School without Walls" could be an ideal potential "beacon" in the A.C.T. if funding could be obtained for it to be structured so that students could learn from home a significant amount of the time, using computer terminals.

* State Education Departments and general Government Departments explore not just the use of computers for dissemination of information (as with Data Base systems) but for two-way dialogue (as with computer conferencing).

* Foundations consider funding task forces of young people to investigate social problems, with the assistance of data processing and telecommunications technologies. There would be a particular emphasis on the young people using computer packages (such as word processing and statistical packages) rather than on having them develop customised computer systems.

* The Federal Government, in consultation with the States, establish a unit specifically responsible for considering and publicising long-term issues in education - in particular in relation to technological change.

8-3. GENERAL ASPECTS

* There is a need for research to be undertaken dealing with innovative applications of satellite technology in education and general public administration. The emphasis should be on exploring new approaches which satellites could facilitate (such as national in-service education activities with participants remaining in their home States) rather than purely on exploring new ways of delivering traditional programs (such as distance education programs).

* There is a need for research to be undertaken into how artificial intelligence based systems may affect education and public administration in the future.

This area has been relatively neglected up to this point in time, partly as a result of most government and education systems only recently coming to grips with the potential impact of micro-computer systems and computer packages on themselves.

Once artificial intelligence based systems become more widely available they could potentially have a massive impact (as is reflected in the scenario). There is a need for unions, educators, and public administrators to define now 'preferable' futures in relation to their use if their introduction is to not result in massive social conflict.

* There is a need for further research into how language

translation computer systems might be used in such areas as ethnic education, and international liaison.

* There is a need for the Australian Law Reform Commission to investigate ways in which criminal data bases could be structured so that information on minor illegal acts does not "stick" with a person for the whole of his or her life.

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12. APPENDIX

12-1. ERIC DESCRIPTORS AND IDENTIFIERS FOR THESIS.

ERIC DESCRIPTORS:

(Key descriptors have a * before them)

Accessibility (for disabled); Adult Education; Artificial Intelligence; Career Education; Change; Change Strategies; Community; Conflict; *Co-ordination; Curriculum Development; Demonstrations (Civil); Disabilities; Disadvantaged; Educational Media; Educational Trends; *Efficiency; *Evaluation; Exceptional Persons; Extention Education; *Futures (of Society); Governance; Governing Boards; Individual Power; *Information Systems; Innovation; International Educational Exchange; Leisure Time; Motivation; Management Systems; Man Machine Systems; Meetings; Motivation; Multilingualism; *Networks; Nonprint Media; Objectives; Open-Plan Schools; Organisational Effectiveness; Outcomes of Education; Parent Associations; *Participation; Planning; Policy; Political Power; Productivity; Redundancy; Schools; Self Determination; Social Action; Socialisation; Specialisation; Standards; Teaching Methods; *Technology; Tokenism; Totalitarianism; Training; Transition.

IDENTIFIERS:

Australia; Automatic Data Processing; Australian Public Service; Commonwealth Public Service; Communicative Competence; Computer Conferencing; *Consultation; Coombs, H. C.; *Data Processing; *Decentralisation; *Devolution; Educational Paradigm; Feedback; Freedom of Information; Hierarchies; International Task Forces;

*Joint Management Review On ADP Management Issues in The Australian Public Service; Libraries; Multipurpose Social Institutions; Public Administration ; Public Policy; Public Service Board; Reid, J. B.; *Review of Commonwealth Administration; *Royal Commission on Australian Government Administration; Scenario; Self-correction; *Telecommunications; Victoria; Victorian Education Department; *White Paper on Strategies and Structure for Education in Victorian Government Schools.